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Using QR Codes During Dynamic New Product Launch

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New products are being introduced to the markets constantly and a big portion of them fail within the first few years of launch (Sivadas & Dwyer 2000). Lack of market understanding is a commonly mentioned cause of new product failure (Baker & Hart 1999, 356). Dynamic launch strategies allow for changes to be made to the launch strategy based on market information at the time of the actual launch in attempt to improve the success of it. New technologies offer new ways of interacting with consumers and acquiring timely consumer and market information. This thesis looked at the perquisites that affect the usability of QR codes as a way to acquire consumer information during a dynamic new product launch. Cui et al. (2011) dynamic model of a new product launch was used as the basis of the theoretical framework of the study.

An online survey was constructed with questions on factors affecting consumers' willingness to use QR codes on a new product package and factors affecting their willingness to give personal information through a QR code. The survey yielded 104 responses that were statistically analyzed using IBM SPSS modeler. The findings of the study suggest that perceived ease of use of QR codes has an effect on consumer's likelihood of scanning codes. In addition to ease of use there needs to be relevant incentives for consumers to be willing to scan QR codes and give personal information. Findings suggest that opportunity to receive a discount coupon, acquire more information about a product or an opportunity to give feedback about the product could work as incentives for scanning a QR code on a new product package. These were not however seen as strong incentives for giving personal information, indicating that stronger benefits are needed to motivate consumers. This study gives insight into the usability of QR codes, but the skewed demographic background of the respondents and limited findings related to incentives of giving personal information indicate that more research is needed on the topic.

Avainsanat – Nyckelord – Keywords
QR code, launch, dynamic model of a new product launch, package

Säilytyspaikka – Förvaringställe – Where deposited

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1 Introduction

1.1 Background

New products are being introduced to the markets constantly. Continuous development and launching new products successfully is a critical factor in the long term profitability and survival of firms (Sivadas & Dwyer 2000). New products, product improvements and modification are often results of long processes including multiple phases leading to commercialization of the product. (Kotler & Armstrong 2006, 275.) Despite the efforts put into the development process a big portion of new products fail within the first few years of launch (Sivadas & Dwyer 2000). Introducing new products is often risky and the costs rise sharply once the process reaches launch phase (Kotler & Armstrong 2006, 287).

Lack of market understanding is a commonly mentioned cause of new product failure (Baker & Hart 1999, 356). Dynamic launch strategies allow for changes to be made to the launch strategy based on the information about the market at the time of the actual launch. This flexibility in the launch strategy has been suggested to facilitate the success of a new product launch in a changing environment. (Hitsch 2006.) Cui et al. (2011) developed a dynamic model of new product launch based on dynamics modeling method. Their model highlights that both short-term and long-term adjustments may be required to respond to market conditions at the time of the launch. The purpose of this study is to investigate how Quick Response (QR) codes could be used to get market information at the time of the launch that could be used to adjust the launch strategy and facilitate success of the new product.

Quick Response code is one of the most popular types of two-dimensional codes that can be read by a smart phone. The code was originally developed by Toyota subsidiary Denso Wayne in 1994 for the purpose of tracking vehicle parts in the automobile industry. Within the past few years the square, maze-looking code has become more popular in the consumer goods industry as a tool that enables consumers' easy access to various types of content. Scanning the code requires a smart phone, which was already in 2013 used by 61 % of 16-74 year old Finnish consumers (Tilastokeskus 2013), and a QR code application. QR codes' popularity is growing especially in USA, Korea and Japan (Shin et al. 2012.), but also Europe is seeing growth in scan rates (comScore 2012).

Due to the novelty of the QR code in consumer goods industry, extensive academic understanding of how the code should be used has not been formed. Companies are using the code in different ways with various products and on a range of platforms. It has been agreed by marketing professionals that consumers need to be informed about what they get from scanning the code and scanning the code should result in real added value to the consumer (NearMe Services 2013). QR codes can be used for two-way communication between the consumers and producers. Shin et al. (2012) found the perceived interactivity of the QR code to have a positive effect on the probability of the consumer scanning the code. They also suggested that the role of interactivity in the use of QR codes might indicate that proactive consumers want to interact with producers in a new way. The interactive nature of the QR codes suggests that they could be used to get information from the consumers.

1.2 Research problem and objectives

In the fast moving consumer goods industry launching new products successfully is vital to the success of firms (Sivadas & Dwyer 2000). The use of QR codes in consumer goods industry has not been widely studied and their potential use in the new product launch process has not been investigated. The growing popularity of the codes (Shin et al. 2012.) suggests that a deeper understanding of their potential is needed. This thesis investigates how QR codes could be utilized during the launch of a new product. The focus will be on the potential of using QR codes on product packages to get information from the consumers that could be used to adjust the launch. The effects of QR codes on purchase behavior are not covered in this study. The aim is to find out what kind of content consumers would like to find behind a QR code on a new product package in order for them to be motivated to scan the code and give personal information to the producer.

Primary research question:

What prerequisites affect the usability of QR codes as a part of a dynamic launch?

Sub questions:

- What affects consumers' willingness to scan a QR code placed on a package of a newly launched product?

- What type of content do consumers want to find behind a QR code placed on a package of a newly launched product?
- What affects consumers' willingness to give demographic information about themselves through a QR code placed on a package of a newly launched product?

From a managerial perspective this study provides insight into the potential of using QR codes as a way of interacting with the consumers to gain consumer information. More specifically this study contributes to the understanding of the expectations that consumers have on the content of QR codes placed on packages of new products and the factors that motivate consumers to scan QR codes and give personal information through them. This understanding helps managers to adjust the content of the code to fit with the consumer expectations to facilitate the use of the code and benefit from the interactive nature of the code by acquiring timely market information from the consumers.

1.3 Central concepts

Quick Response (QR) code is a two-dimensional mobile barcode that can be read by a smart phone or a tablet using a QR code scanning application. QR codes can be static or dynamic, depending on weather the content behind the code can be changed or not.

Launch refers to the final phase of the new product development process when a developed product is commercialized by introducing it to the market. (Cooper 1979.)

Dynamic model of a new product launch is a dynamic launch model based on the systems dynamics modeling. The model was proposed by Cui et al. (2011). It suggests that market information received at the moment of launch can result in both short- and long-term adjustments to the launch strategy. Short-term adjustments result in tactical level changes that do not affect the scale of the launch. Cui et al. (2011) suggested that in case where actually market demand after the launch differs greatly from what was anticipated changes in strategic level are needed as tactical changes will not be enough to respond to the changes. Long-term adjustments refer to strategic adjustments that affect the scale of the launch. Dynamic model of a new product launch will form the basis of the theoretical framework of this study.

Package: The main purpose of a package is to protect the product from physical, chemical and biological strain through the chain from the factory to the table. A package also works as an information and marketing tool. (Järvi-Käärinen & Ollila 2007, 11.) This thesis will only look at consumer units of food product packages and focus on the role as an information and marketing tool.

1.4 Structure of the study

Theoretical part of this study starts with looking at new product development and determinants of new product success, focusing on market orientation and speed to market. The theoretical framework of this study is based on the dynamic launch strategy, which is examined in the same chapter. Chapter three looks at new products from a buyers' perspective. The chapter covers theory about buyer decision process and the adoption of new products.

This study investigates the use of QR codes on a food product package. Chapter four focuses on product packages and the role of package as a communication tool. The chapter also covers some of the challenges related to product packages that QR codes could address. Chapter six looks at QR codes, previous research and statistics related to the use of codes. Using QR codes as a part of a dynamic launch model to get consumer information requires understanding of the perquisites that affect consumers' willingness to give personal information. Previous research related to consumers' willingness to give information is covered in chapter 5.3. Chapter six presents the theoretical framework and research questions of this study and summarizes the implications of previous research.

Chapter seven covers the methodology of this study introducing the research design, data collection methods, survey construct and analyzes methods. The results are presented in chapter eight. Discussion and conclusion are presented in chapter nine.

2 New Product Development

2.1 Development Process

Competition in the consumer goods industry is increasing and existing products are constantly forced to defend their position against new ones. Product life cycles have become shorter and new products are developed at a fast pace to answer consumers' changing needs and tastes, taking advantage of new technologies. (Kotler 2003, 349.) New product development is risky, but often of vital strategic importance for companies operating in highly competitive environments (Cooper & Kleinschmidt 1994).

The process of developing new products varies greatly depending on the company, markets and the product. Kotler and Armstrong (2006, 276-287) described the new product development process as having eight phases. The development process starts with systematic idea generation that can take advantage of both internal and external sources. Once a bundle of ideas has been generated the ideas are analyzed in a more detail manner. The goal of the idea screening is to evaluate the ideas against a set of criteria and find out which ideas are in line with the companies strategies and objectives. Setting of appropriate criteria is important as the costs related to new product development rise after the screening phase. Once the ideas have been screened the most potential ones are developed into concepts that are tested with groups of target consumers. Based on the tests, an idea of the appeal of the concept and potential for future sales is generated.

If the new product passes the concept test phase, a marketing strategy is developed for the product. The strategy includes a description of the target market, planned product positioning, planned price, distribution and marketing budget for the first year as well as planned sales, market share and profit goals for the first few years. A plan of long-run sales, profit goals and marketing mix strategy should also be included in the marketing strategy. Based on the marketing strategy a business analysis is conducted to evaluate the business attractiveness of the concept. Sales history of similar products can be used to estimate future sales and evaluate the level of risk based on the minimum and maximum expected sales. The goal is to evaluate whether the product will meet company's sales, costs and profit objectives. If the product is considered to meet these objectives the product concept is developed into a physical product. This phase often involves large investments

as a prototype needs to be developed, tested and further developed into a proper product. (Kotler & Armstrong 2006, 283.)

During the test marketing phase the product is introduced into a more realistic setting in order to give the marketer experience with marketing the product. Test marketing enables the marketer to get information about the product, pricing, branding, packaging and budgeting before taking on the expenses related to a full launch. A standard form of test marketing involves conducting a full launch in a few representative cities and following it up with store audits, consumer and distributer surveys and other measures of launch success. The results can be used to modify potential challenges with the product, fine tune the marketing strategy and forecast national sales and profits. The challenge with this type of test marketing is that it takes time and gives the competition an opportunity to take a look at the product and its performance and possibly interfere with it. Test marketing can also be conducted in a controlled way in a store, where a panel of consumers shop and their behavior related to the new product is tracked. This type of controlled test marketing enables the analyses of specific marketing actions. Test marketing can also be conducted in a simulated lab environment. (Kotler & Armstrong 2006, 285-287.)

The final phase of the new product development process is the commercialization of the product. Launch phase is affected by the strategic decisions taken earlier on the development process related to the product and its target market (Choffray & Lilien 1984). Introducing the product to the market is a critical phase as it involves high costs and high risks. A successful launch has been shown to be a critical factor in the success of the product. A bad launch strategy can cause even a good product to fail. (Cooper 1979.) According to Baker and Hart (1999, 356) the decision to launch should take into consideration the concept of sunk costs and be based on anticipated revenues and costs. The marketer should evaluate whether the new product can satisfy the market opportunity it was developed for at a cost appropriate to the marketer and the consumers. It should also be considered that the situation in the markets can change fast and can be different to that of the start of the new product development process. Continuous research and adjustments are required to cope with the changes. This thesis will focus on the commercialization phase and take a look at how QR codes could be used during the launch to acquire consumer information.

2.2 Determinants of New Product Success

2.2.1 Market Orientation

A big portion of new products fail within the first few years of launch. In the food industry some observers claim a failure rate of up to 70 to 80 % (Gresham et al. 2006). Inadequate understanding of the market is a commonly mentioned cause of new product failure. Inadequate market understanding can lead to overestimation of the market size, incorrect positioning, segmentation, targeting, and pricing and ineffective advertising. (Baker & Hart 1999, 356.) Other mentioned causes of new product failure include poor product design, stretching brands badly, challenges with sufficient distribution coverage and costs exceeding estimations. (Kotler 2003, 305.)

Firms must create sustainable competitive advantage to continuously perform better than the market (Aaker 1989, 91). Creating sustainable competitive advantage requires the ability to create superior value to consumers (e.g. Kohli & Jaworski 1990, Shapiro 1988, Webster 1988). Market orientation of a firm has been linked with improved understanding of market situation, trends, competitor actions and consumer needs. This understanding has been suggested to reduce the risk of new product failure (Cooper 1979, Cooper 1984, Baker & Hart 1999, 356). Market orientation can be described from an operational or a cultural perspective, both of which emphasize the role of customer information. Kohli and Jaworski (1990) described market orientation as an organization wide process of gaining and disseminating information and responding to current and future customer needs. Market orientation as an organizational culture is described as a culture that efficiently creates behaviors needed to create superior value to consumers. Customer orientation, competitor orientation and inter-functional coordination are described as the three behavioral components of market orientation. Customer orientation can be defined as an attempt to create superior value to customers by continuously getting to know them and building up knowledge and understanding about them and their changing needs. Continuously building and updating an understanding of the market and competitors can be described as competitor orientation. Inter-functional coordination builds on the information gained through the two behavioral components and takes advantage of coordinated efforts of multiple department of the firm, not just the marketing department. (Narvar & Slater 1990, Dewar, R. & Dutton, J.E. 1986.)

Narvar and Slater (1990) suggested that in addition to the three behavioral components market orientation has two decision criteria: a long term focus and a profit objective. Their study found market orientation to be a determinant of business profitability and performance: businesses with highest market orientation being associated with highest profitability. Being market oriented and acquiring market understanding requires a corporate culture that gives weight to the findings of the research and a top management that sets such climate. Entrepreneurial corporate culture has generally been regarded as the most effective one for achieving successful new product development outcomes. (Baker & Hart 1999, 356.) People involved in the process are also crucial in determining the outcome (Baker & Hart 1999, 165-171). Research suggests that in addition to having a positive effect on overall performance market orientation also has a positive effect on the market performance of a new product (Slater & Narver 1994, Baker and Sinkula 1999). This view is supported by Varadarajan and Jayachandran (1999) who suggested that firm's understanding of their customers determines the effectiveness of a firm's innovation capability and that market orientation fosters the acquiring of such understanding. Innovation and new product development was argued by Slater and Narver (1994) to occur more likely in a market-oriented business. Manuela et al. (2013) later suggested that even though market orientation affects the performance of new products on the market it does not actually affect the number of new products successfully launched. Striving to understand customers and competitors and co-coordinating activities of different functions accordingly, in an attempt to create value to customers enables firms to achieve greater success with their new products.

The lack of market understanding is seen by many as a relevant cause of new product failure, but the relevance of market orientation is not always seen to be linked to new product failure in the same way. The effect of market orientation is seen to vary depending on different factors related to the new product. There is however no agreement on how the different factors alter the effect. (Atuahene-Gima & Ko 2001, Cooper 1979). One factor seen to have an effect on the relevance of market orientation to the success of new products is the degree of newness of the product. Products that involve risky, creative innovations or new technologies resulting in non-linear changes can be described as radical (McKee 1992). New products can also be incremental and involve only minor changes or adoption to current technologies (Dewar & Dutton 1986). Atuahene-Gima and Ko (2001) argued that radical innovations require taking risks, which is lowered by market focus. Taking

risks is not as desirable if the focus is strongly on the market, as customers tend to describe their needs in terms of existing and familiar products. Market orientation therefore enforces the creation of "me-too" products (Bennett & Cooper 1981), which have been said to account for up to 77 % of new food products (Costa & Jongen 2006). Market orientation therefore has greater effect on the success when the innovation is only incremental (Manuela et al. 2012), which could be a hindrance in a firm's ability to create sustainable competitive advantage (Bennett & Cooper 1981). The opposing view sees market as a source of ideas for new products and product improvements, market orientation reinforcing product development (Goldenberg et al., 2001). Understanding consumers' desires and needs can encourage development of innovations that respond to those needs in new ways (Cooper 1979). Radical innovations often require customers to change their behavior and from a firm a greater market orientation to successfully launch such product (Manuela et al. 2012). The understanding gives the firm better possibility to develop products that are compatible with customer needs and thus succeed in the market (Cooper 1979, Cooper 1984).

There seems to be an agreement that market orientation has three key elements: customer and competitor understanding and multi-functional coordination, and these have an effect on the success of new products. Wong and Tong (2012) suggested that there is variance in the influence these elements have on new product's success. Due to this variance they claim that market orientation should not be studied as one concept, but instead from three separate perspectives. Their study found competitor understanding to play the smallest role. This was further supported by another study they conducted in 2013, which found support for the importance of customer orientation and cooperation between R&D and marketing, but contradicting result on the role of competitor orientation (Wong & Tong 2013). Also other studies have found contradicting evidence of the importance of competitor orientation. Noble et al. (2002) and Salomo et al. (2003) found it to have a positive effect, whereas Armstrong and Collopy (1996) and Armstrong and Green (2007) found a negative effect on new product success. These finding suggested that scarce resources should be focused on gaining customer understanding and taking advantage of that understanding through multi-functional cooperation, especially between R&D and marketing. When the product is developed to meet customers' needs and outperform existing products, based on customer understanding a marketing plan can be developed to arouse market expectation to ensure success of the product.

The challenge with getting to know your customers is that customer needs are continuously changing. New products are developed and launch strategy is formed based on pre-launch information about the customers and markets. Cui et al. (2011) suggested that launch strategies should be adjusted according to the market conditions after a new product is launched. This would require gaining customer information at the moment and after launch. This thesis looks at ways in which QR codes could be used to acquire such information by finding out how consumers can be encouraged to scan codes and give useful information about them that can be used to modify the launch strategy.

2.2.2 Speed to Market

In the highly competitive consumer goods markets companies are bringing new products to the market at constant pace. Product life cycles have become shorter and companies that are able to perform fast and flexible product development are often rewarded for the risk. (Kotler & Armstrong 2006, 288-299.) These companies have been suggested to enjoy substantial competitive advantage (Cooper & Kleinschmidt 1994) as they are able to capitalize a new product opportunity before the competition (Baker 1999, 174).

Speed to market has been considered by some as the most crucial factor in new product success (Johnson et al. 2009). Test marketing done by packaged consumer goods companies has declined and especially simple line extensions and copies of successful competitor products are often launched without any test marketing (Kotler & Armstrong 2006, 285). There are contradicting findings on how different variables affect the importance of time to market. Regarding market uncertainty Kessler and Bierly (2002) found time to market to be more crucial in predictable environments, whereas Chen et al. (2005) came to the opposite conclusion of speed being a less important factor of new product success in cases of low market turbulence. Sheng et al. (2013) found market growth rate to enforce the effect of speed to market as a success factor.

Johnson et al. (2009) found support for the importance of time performance on new product development. They found the effect of time performance on new product success to strengthen when combined with a higher market knowledge competence. They concluded that without sufficient market knowledge, understanding customer needs, it does not matter

how fast the product reaches the markets it will most likely not succeed. Considering that consumers' needs are constantly changing there is a risk that empathizes on speed of the development might result in not putting enough emphases on gaining market knowledge. Speeding to market has led many companies to reduce test marketing that has enabled deeper understanding of the new product's target market close to the moment of the actual launch. The information gained through test marketing can be used to change the product and the launch strategy. (Kotler & Armstrong 2006, 285-299). Skipping the test marketing can save time, but with the risk of not being able to take into consideration the changes in consumer needs that might have occurred during the development process. Hitsch (2006) proposed a dynamic launch model to be used to lower the risk of related to the market uncertainty and constantly changing consumer needs. The next chapter will look at the dynamic launch strategy and how it can be used as a part of a quicker launch cycle.

2.3 Dynamic Launch Strategy

As discussed above, the lack of market understanding is a commonly mentioned cause of new product failure (Baker & Hart 1999, 356) and market oriented firms have been suggested to enjoy better success with their new products (Slater & Narver 1994). Speeding to market, strong competition, high level of market uncertainty and possibility of quickly changing market conditions make it challenging for producers to hold adequate market understanding. Launch strategies are often based on past experience and forecasts. When based on incurrent market information the launch strategy might not be able to accurately capture the changed market conditions at the moment of launch, causing the product to fail (Hitsch 2006). Research has shown that even good products can fail due to inadequate launch strategies, making the launch a critical phase of the new product development process. (Cooper 1979.)

Hitsch (2006) suggested that the challenge of demand uncertainty could be faced with a dynamic launch model that allows for the adjustment of the launch strategy after the launch. In that way the launch strategy can be adjusted according to actual market conditions and the decision to stay or exit the market can be made based on actual sales of the new product. Flexibility regarding timing of promotion activities, manufacturing and logistics has been recognized to be a factor that can facilitate a successful launch in a changing environment. Cui et al. (2011) pointed out that there is however little research on

how the launch strategies are actually dynamically adjusted after the launch. They developed a dynamic launch model based on the systems dynamics modeling method. Their model attempts to show how and why dynamic launch strategies outperform static ones.

Cui et al. (2011) classified launch strategies into two types based on the level of adjustments made. Static launch strategies involve only short-term adjustments at tactical level. The adjustments are made keeping the launch scale stable, but doing small changes, such us adjusting production scale, inventory level or pricing to answer to small changes in market demand. Dynamic launch strategies involve strategic, long-term adjustments that affect the scale of the launch and also result in tactical level adjustments. In cases where actually market demand after the launch differs greatly from what was anticipated changes in strategic level are needed as tactical changes will not be enough to respond to the changes.

Using this classification of short- and long-term adjustments and earlier empirical evidence on new product diffusion, advertising, manufacturing and inventory management Cui et al. (2011) developed a dynamic model of new product launch, presented below in Figure 1. It is highlighted in their model presented below that both short-term and long-term adjustments may be required to respond to market conditions at the time of the launch.

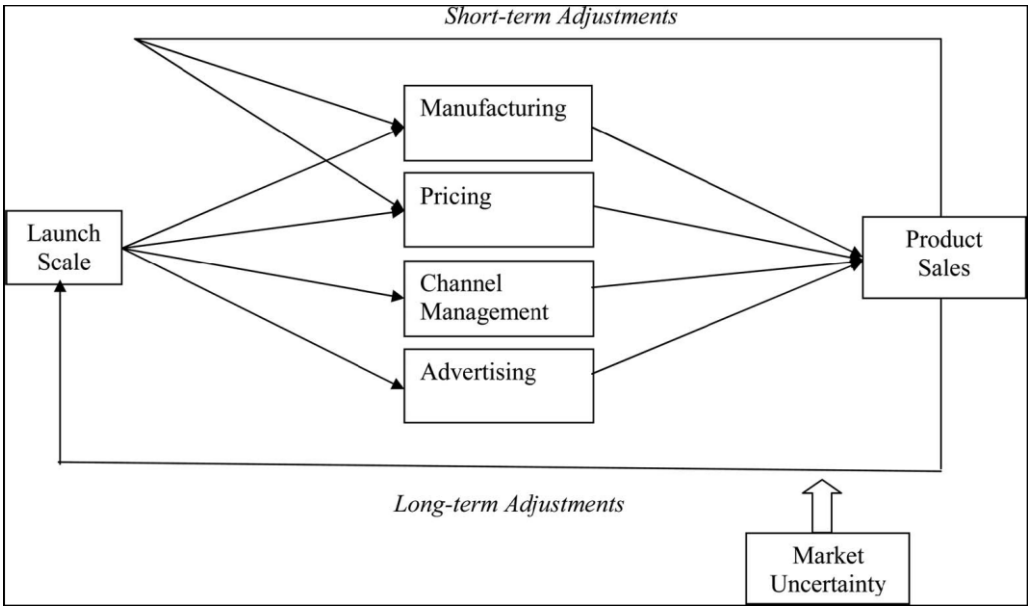

Figure 1. Dynamic model of new product launch (Cui et al. 2011).

In the dynamic model by Cui et al. (2011) long term adjustments that affect the launch scale are made based on the perceived market conditions at the time of the launch. Figure 2 below presents how the launch scale is adjusted. The positive reinforcement loop shows how the launch scale affects the tactical activities related to the launch, such as marketing activities and pricing to increase sales which in turn motivate managers to increase resource commitment to the launch and thus increasing the launch scale. Higher launch scale however also increases managers' expectations of sales that affect their perception of the market conditions at the time of the launch. Perceived market conditions were described by Cui et al. (2011) as a comparison of actual adoption rate and current expected sales:

$$PMC(t) = ADOP(t)/CES(t) - 1 \quad (23)$$

where PMC(t) is perceived market condition, ADOP(t) actual adoption rate and CES(t) current expected sales. When PMC(t) > 0 launch scale should be adjusted up as the market is responding better than expected and adjusted down when PMC(t) < 0.

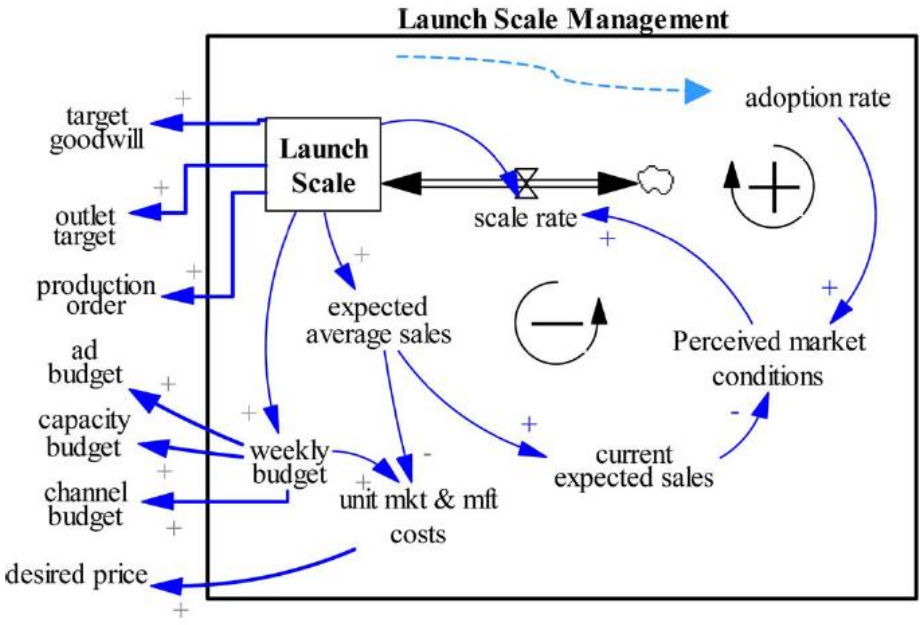

Figure 2. Launch scale management: dynamic module (Cui et al. 2011).

Cui et al. (2011) highlighted that launch strategies involve managerial expectations and it is important to adjust those together with the launch efforts as new information on market conditions is gained. To be able to utilize the gained information to adjust the launch scale quickly it is vital to have flexibility in the processes related to supply chain and other functions in the company.

Cui et al. (2011) model is focused on gaining information regarding the market demand in traditional ways by analyzing actual sales of the new product and comparing them with expected sales of the new product. New technologies offer a potential for acquiring different types of information related to the new product and consumers buying it. One of the strategic decisions related to the launch that affects the launch scale is the target market of the product (Choffray & Lilien 1984). This thesis looks at how QR code could be used to acquire consumer information at the moment of the launch that could indicate what type of consumers buy the newly launched. This information could be used to re-evaluate the strategic decision about the target market. Changes in the target market could affect the launch scale and also result is small scale adjustments.

The following chapters will take a closer look at consumers' purchase process of new products, package as a communication tool into which the QR code could be applied and what features of the QR suggest that it could work as a tool to acquire consumer information during the launch process.

3 Buyer Decision Process of New Products

3.1 Buyer Decision Process

Buyer decision process can be divided into five steps. The process starts with the consumer recognizing a need that is triggered by internal stimuli, such as hunger, or external stimuli, such as advertisements. Once the need is recognized information search starts. Search can include a wide range of sources such as friends, internet and advertisements. Information search is followed by an evaluation of alternatives that leads to a set of final options and a purchase intention. The attitudes of others and unexpected situational factors can affect whether the purchase intention is transformed into a purchase decision. After the purchase, expectations and perceived performance of the product are compared and the buyer decides whether they are satisfied with the product. (Kotler & Armstrong 2006, 155-158.)

Festinger (1957) proposed in his theory of cognitive dissonance that a purchase can result in discomfort caused by the sense of loss of the positive attributes of non-chosen alternatives and the perceived negative attributes of the chosen product. He suggested that this dissonance can lead to dissatisfaction with the purchase decision and negatively affect the repurchase intentions. He also suggested that those experiencing dissonance would be motivated to attempt to reduce it. Further research has suggested that post-purchase communication that provides re-assurance of the purchase choice can be used to reduce this dissonance (Milliman & Decker 1990). Producers should help consumers in their attempt to reduce dissonance to ensure customer satisfaction and repurchase. This thesis investigates how QR code could be used as a tool to give consumers post-purchase information that would help in reducing possible cognitive dissonance and at the same time collect useful consumer information (incl. possible reasons behind possible dissonance) to modify the launch.

The purchase decision process is not always followed step by step and the time that is spent on each phase varies depending on the product purchased. Behavior can vary from complex to simple habitual buying behavior. Complex buying behavior occurs when consumer is highly involved with the product and perceives big differences between different brands. These type of products can often be expensive and highly self-expressive. The buyer will do extensive information search on the product, form beliefs and attitudes about it and finally make a thoughtful purchase decision. The role of the producer is to help the buyer move through the process. When the consumer does not see great differences between

alternative brands of such product cognitive-dissonance reducing behavior can occur. Consumer can look around for alternatives, but respond primarily to price and purchase convenience and make a purchase decision quickly. (Kotler & Armstrong 2006, 154-155.)

At the opposite end habitual buying behavior occurs in case of frequently purchased, low cost and low involvement products, where the consumer shows little or no brand loyalty. Purchase is based on habit and no extensive decision process is executed. Consumers receive information passively and conduct no after purchase evaluation. Producers should focus on price and sales promotions. When there are significant perceived differences among brands of low involvement products consumers can show variety seeking behavior. Market leader can attempt to encourage habitual buying behavior whereas minor brands can take advantage of the possibility high brand switching probability. (Kotler & Armstrong 2006, 154-155.)

3.3 Buyers and New Products

The adoption of new products can be described as a five step process that follows the lines of buyer purchase process. Adoption process starts with being aware of the product. Awareness develops into interest and consumer seeks information. Based on the information consumer considers whether to try the new product or not. If the consumer decides to try the product a small scale trial is used to better estimate the value of the product. When the result of this valuation is positive consumer adopts the product and makes regular use of it. The readiness to adopt new products varies among consumers. Innovator (2,5 %) do not avoid risk and are the first to adopt new products. Early adopter (13,5 %) are opinion leaders in their community and adopt new products early, but carefully. The early majority (34 %) is followed by a skeptical late majority (34 %) that only adopts products once the majority has started using them. The laggards (16 %) are suspicious of changes, bound to tradition and the last ones to adopt any new products. (Kotler & Armstrong 2006, 160-161.) Research has shown that there is variance in the adoption of new product and service across global markets. Western European countries have been found to have consumers with highest innovativeness in terms of rapidly adopting new products. (Tellis et al. 2009.)

The dynamic launch model used in this thesis emphasizes the need to adjust the launch based on consumer and market information gained during the launch (Cui et al. 2011). As described above consumer's characteristics affect their readiness to adopt new products. Innovators and early adopters are among the first to start using new products. This suggests that the information gained from the market right after the initial launch, often reflects the views of innovators and early adopters. To gain information right after the launch these types of consumers need to be activated to give feedback.

In addition to individual characteristics of the consumer characteristics of the new product can affect the rate of adoption. The perception of the superiority of the product to existing products and the degree to which the product fits with the values and experiences of the consumer can affect the adoption. Complexity, degree to which the innovation can be tried on limited resources (e.g. price, availability) and the degree to which the new product can be observed or described by others can also have a positive or a negative effect on the adoption. (Kotler & Armstrong 2006, 161-162.)

4 Product Package as a Communication Tool

The main purpose of a package is to protect the product from physical, chemical and biological strain through the chain from the factory to the table. Especially when food products are in question the package plays a vital role in ensuring that quality is preserved so that the consumer gets the product in a good and safe condition. A package also works as an information and marketing tool. (Järvi-Käärinen & Ollila 2007, 11.) After self-service stores became dominant and due to increased competition the role as a marketing tool has become more important. Packages must be designed to work well from a logistical point of view, but also be able to stand out on the shelf and describe the product. (Kotler & Armtrong 2006, 244.)

Packages must be designed to be optimal in all the different phases of the process that lead to a consumer using a product. Optimal packages minimize spoilage and are standardized to certain extent to not cause hindrance or unnecessary expenses in the process. Products are packed into multiple packages that all have different roles in the product chain. Consumer package or sales keeping unit (SKU) is the package that the consumer buys and uses. Consumer package can include multiple portion packs. Different products can be combined to form a multipack that enables consumers to buy multiple products in the same consumer package. Consumer packages are packed into a distribution package that is often also used as a display on the store self. Distribution packages are further packed into a transport package. Distribution packages are generally the smallest unit retailers are able to buy. (Järvi-Käärinen & Ollila 2007, 10.) Distribution and transport packages must follow standardized modular dimensioning that enables cost and space effective transportation and storing. Their main role is to protect the product. There are also requirements on the information that a distribution package must contain. (Järvi-Käärinen & Ollila 2007, 46.)

This thesis looks at consumer packages and focuses on their role as a communication tool. Food product packages are faced with the challenge of limited space, but large amount of information that is required by law to be on the package (Järvi-Käärinen & Ollila 2007, 51). Hyvönen et al. (2008) found consumers to be interested in having clearer information about the ingredients, origin and disposing of the package. The challenge is how to fit this additional information on to limited space. QR codes are a tool to minimize the space

needed for communication of information and can therefore be used on a package to face the challenge of limited space. The consumer package is present at the moment of purchase but also when consumer is at home. Placing a QR code on a consumer package could therefore work as a communication tool during the purchase decision moment, but also during consumer's post purchase behavior. In this thesis the focus will be on QR codes potential to work as a communication tool during post-purchase phase meaning that it could actually be placed inside a package, an area of which consumer only sees once using the product.

5 Quick Response Codes

5.1 Quick Response Code Technology

Quick Response (QR) code is one of the most popular types of two-dimensional codes that can be read by a smart phone or a tablet using a QR code scanning application. QR code scanning applications use a camera to scan the code. Applications are available for most smart phones and tablets to be downloaded for free and in some new phones applications are ready in the phone. QR code can encode information in different forms including text, business card, e-mail, voice file and URL link. The code needs to be around a minimum of 2 cm x 2 cm to be easily scanned and it can be placed on different surfaces. (Shin et al. 2012.)

QR codes can be static or dynamic. The information in a static code cannot be changed without altering the whole code. If the code includes a link to a webpage the content of the webpage can be changed, but the code cannot be redirected to a new webpage. If a static code includes only text internet is not required to read the code. Dynamic code offers greater flexibility as the content of the code can be changed without altering the code itself. Dynamic codes are controlled through a control page where the use of the code can be tracked: the number of scans, where the scanning has taken place and when. Most codes are black and white and include the square maze looking code and a white frame around the code. Codes can however also be colorful and embedded in internet pages. Simple QR codes can be created for free, but most dynamic code creators that enable tracking of scans and correcting options for broken codes need to be bought. (QR-koodi -tiedonportti 2013.) Figure 4 below shows an example of a static QR code with text.

Figure 3. Example of a static QR code with text behind the code.

5.2 Use of Quick Response codes

Using QR codes requires a smart phone which was in year 2013 used as a primary phone by 61 % of 16-74 year old Finnish consumers. Over 74 % of 16-44 year olds used a smart phone out of which 25-34 year olds were most often using smart phones with 81% of them having one in use. 60% of men and 51 % of women were using a smart phone. 51 % of 16-74 year olds use social communities regularly. (Tilastokeskus 2013.)

Mobile barcode (QR codes and other mobile bar codes) use is increasing. World's leading mobile engagement solutions provider Scanbuy Inc statistics show a 33 % increase in the number of mobile bar code scans in a period during 2013 vs. equivalent period during 2012. High tech and retail industries receive most scans and the scanned typically included application downloads, discounts and competitions. Men were more active in scanning, with 63 % of the scans done by men. From an age perspective the most scans were done by 35-44 year olds (25 %) followed by 23-34 year olds (22 %). (ScanLife.com 2014.) The use of QR codes has been increasing especially in Korea, Japan and USA, but also in Europe. Based on 2012 statistics from UK, Germany, Italy, France and Spain QR code scans grew by 96 % from 2011 to 2012. Out of all smart phone users 14,1 % scanned a QR code. Most of the scans resulted in receiving product (71,7 %) or event information (31,8 %). Also coupons and offers (19,4 %) and application downloads (13,4 %) were received through a scan. (comScore 2012.) Watson et al. (2013) found similar results in their study in which 73 % used the code to find further information from a website. Their research showed a big difference in the number of people who had scanned a QR code compared to comScore (2012) statistics: 41,7 % of respondents had scanned a QR code and further 45,5 % knew what they are, but had never scanned one. Consumers are scanning QR codes in different places. Okazaki et al. (2013) and ComScore (2011) statistics showed that consumers prefer to scan QR codes at home, where as Watson et al. (2013) found 58 % of people to cite that they use QR codes on the streets and 56 % at home.

In their research Watson et al. (2013) also looked at reasons why consumers had not scanned QR codes. The most commonly mentioned reasons were that "their phone is not able to read QR codes" (40 %), "they are not aware of the benefits to scanning a QR code" (33 %) and "they have never been shown how to scan a QR code" (23 %). They also found that reasons for not scanning a QR code again were that "most QR codes don't seem to

offer any benefits or incentives to bother scanning them" and "QR code readers are awkward to use".

QR codes are used in different industries for different purposes, for example airlines use them in boarding passes to store information and libraries to advertise online services. In the consumer goods industry QR codes are mostly used in advertisements, magazines and product packages. (Shin et al. 2012.) Printed magazines and newspapers have been found to be the most popular source of scanning the code followed by packages (ComScore's 2011). Watson et al. (2013) had similar findings with newspapers and magazine adverts being the most popular source of scanning, but product packages coming only after outdoor advert and poster and flyer or leaflet. There are some successful examples of QR code use in consumer goods campaigns, for example a German toy store MyToys.de made a QR code out of real Legos to activate consumers to engage in a puzzle of figuring out the message behind the code, in return for a link to a store where they could buy the package of Legos used to create the code. The campaign was a success and resulted in great sales boost. (Barber 2009). Due to the novelty of the QR codes in consumer goods industry there is however no clear academic understanding of how and for what type of products the codes should be used. Marketing professionals have agreed on some basic rules for using the code: tell consumers what they get from scanning the code, make sure there is real added value in scanning the code and direct scanners to mobile optimized content. (NearMe Services 2013.)

The challenge with QR codes is that the information behind the code needs to be requested by the consumer. This means that consumer needs to be motivated to go through the trouble of scanning the code to receive the information. Watson et al. (2013) suggested that this need to request information might actually be a feature of the code that potentially interests consumers. Research done at the time before wide smart phone use indicated that consumers found mobile marketing (at that point done mainly through text messaging) to be irritating (Muk 2007), invading their privacy (Windham & Orton 2002) and intrusive (Monk, Carroll, Parker and Blythe 2004). Research done by Tsang (2004) indicated that getting prior permission for the mobile advertising had a positive effect on the attitude towards the advertising. In contradiction to tradition text message marketing QR codes give the consumers the control over the content they receive by choosing whether to scan the code or not.

Shin et al. (2012) suggested that as with new technology in general with QR codes the perceived ease of use and perceived usefulness of the technology affect the consumers' willingness to start using the code. They however suggested that in addition to these the use of QR codes is influenced by the perceived interactivity of the code. Consumers might see positive features of using the code, but want to be ensured of the security and dependability of the code before actually scanning it. Perceived interactivity can facilitate the shift from intention of scanning a code to actual behavior. Shin et al. (2012) found the influence of perceived interactivity to be of bigger importance in QR codes than in other traditional bar codes. The codes are a way to interact with other consumers and in case of products, the producer, not only a way to receive information. There is also a positive correlation between the users of interactive Facebook and Twitter and QR code users. 57 % of Facebook and Twitter users in America had scanned a QR code in year 2011 and 40 % of them had done it five or more times within the year (ComScore 2011).

Shin et al. (2012) suggested that the role of interactivity in the use of QR codes might indicate that proactive consumers want to interact with producers in a new way. QR code can offer great potential in creating new ways for consumers and producers to interact and communicate. QR code could be a good tool to use during the post purchase phase of a new product. It could be used to open communication to the consumer giving the consumer information to reinforce the purchase decision and on the other hand getting information about the consumer that could be utilized in adjusting the launch strategy. The next chapter looks at factors affecting consumers' willingness to give information.

5.3 Consumers' Willingness to Give Information

Mobile technology has opened new ways of communication and marketing making it easier for consumers to communicate not only with each other, but also with producers. Producers are also interested in the opportunities technologies offer for getting consumer information. Numerous studies have however pointed out challenges of intrusiveness and privacy concerns related to mobile marketing (e.g. Windham & Orton 2002 and Monk, Carroll, Parker & Blythe 2004).

Sultan et al. (2009) studied factors influencing consumers' acceptance of mobile marketing and their willingness to access content or give personal information through a mobile activity in order to get something in return. They found greater risk acceptance to have a positive effect on the willingness to share information. In their study they compared U.S., an established market, and Pakistan, an emerging market, and found that in the U.S. sample greater risk acceptance also affected willingness to access content. Heightened privacy concerns resulted in lower risk acceptance, suggesting that trust is a key factor in getting consumers to access contents and share information. In a later study Rohm et al. (2012) found desire for privacy and risk avoidance to affect negatively attitudes towards mobile marketing of Chinese and Western European youth consumers. In their study risk avoidance was apparent especially among Western Europeans, which suggests that it would be a relevant factor also in case of Finnish consumers.

The positive correlation between the users of interactive Facebook and QR code (ComScore 2011) raises an interesting question of weather also QR code users might be willing to share personal information as the millions of Facebook users do. The willingness of Facebook users and users of other social networking sites to share personal information suggests a lack of privacy concern among young consumers (Gross & Acquisti 2005). Gao et al. (2010) found in their study of young consumers in China that risk perceptions could be overcome by meaningful incentives and compelling content. Sultan et al. (2009) findings also indicated that in order to facilitate consumers to give personal information producers need to recognize the trade-offs consumers may make concerning risk tolerance and give consumers meaningful incentives and benefits to facilitate these trade-offs. This suggests that in order for consumers to be willing to give personal information via QR code the content needs to be compelling and work as an incentive for giving information. This study will investigate what types of contents would facilitate consumers to give personal information.

6 Theoretical Framework

The purpose of this research is to examine what prerequisites affect the usability of QR codes as a part of a dynamic launch model. A big portion of new products fail within a few years of launch (Sivadas & Dwyer 2000) and research has attempted to define the determinants of successful new products. Inadequate understanding of the market is a commonly mentioned cause of new product failure (Baker & Hart 1999, 356) and market orientation of a firm has been linked with improved understanding of the market situation, trends, competitor actions and consumer needs (Cooper 1979, Cooper 1984, Baker & Hart 1999, 356).

In the fast moving, highly competitive, consumer goods industry speed to market has been found to be another factor affecting success of new products (Johnson et al. 2009). Speeding to market has led to decline in test marketing done by packaged consumer goods companies, which has typically been a way to acquire timely market information (Kotler & Armstrong 2006, 285). Quickly changing market conditions and speeding to market make it challenging for producers to hold adequate market understanding. Launch strategies are often based on past experience and forecasts instead of current market information. Resulting in that it might not be able to capture the changed market conditions at the moment of launch. In the dynamic launch model the launch strategy can be dynamically adjusted after the launch according to the actual market conditions at the moment of launch. (Hitsch 2006.)

Cui et al. (2011) developed a dynamic model of new product launch where launch strategies can be adjusted on a tactical level involving only short-term adjustments or on a strategic level involving also long-term adjustments that affect the scale of the launch. Their model relies on getting market information through product sales. This thesis looks at how QR codes could be used as an additional tool to acquire market information at the moment of launch that could be used to make adjustments to the launch.

Popularity of QR codes is increasing and consumers are scanning the codes from different sources (ScanLife.com 2014). Research done by Watson et al. (2013) indicated that 41,7 % of respondents had scanned a QR code. The respondents who had not scanned a code reported the reasons to be that their phone was not able to read QR codes (40 %), they are

not aware of the benefits to scanning a QR code (33 %) and they have never been shown how to scan a QR code (23 %). Earlier research, covered in chapter five, suggests that there are various factors that affect the usability of QR codes as a part of a dynamic launch model. Familiarity with QR codes, perceived ease of use and clear benefits of scanning the code are factors that could have a positive effect on consumers' willingness to scan a QR code on a package of a newly launched food product. Statistics and research suggest that additional product information, opportunity to receive coupons or offers and the opportunity to communicate with the producers or other consumers are contents that could facilitate consumers to scan the code. Some of these could also work as incentives for consumers to give personal information to the producer through the code.

The purpose of this study is to investigate which factors affect the use of QR codes, what type of content consumers' would like to find behind a QR code placed on a package of a newly launched product and which factors have a positive effect on consumers' willingness to give personal information through a QR code. The dynamic model of a new product launch (Cui et al. 2011), presented in chapter 2.3 in figure 1, will be used as the basis of the theoretical framework of this thesis. The model is adjusted by adding consumer information received via QR code as an output of the launch. Consumer information together with product sales function as sources of market information that can be used to make both short- and long-term adjustments to the launch. In the empirical study we will investigate what prerequisites affect the usability of QR codes as a tool to acquire consumer information during the launch phase of a product. The focus will be on the perquisites related to gaining personal information that could be used to re-evaluate the decision of the target market. Figure 4 on the next page presents the theoretical framework of this study: the dynamic model including consumer information acquired via QR code as an additional output of the launch.

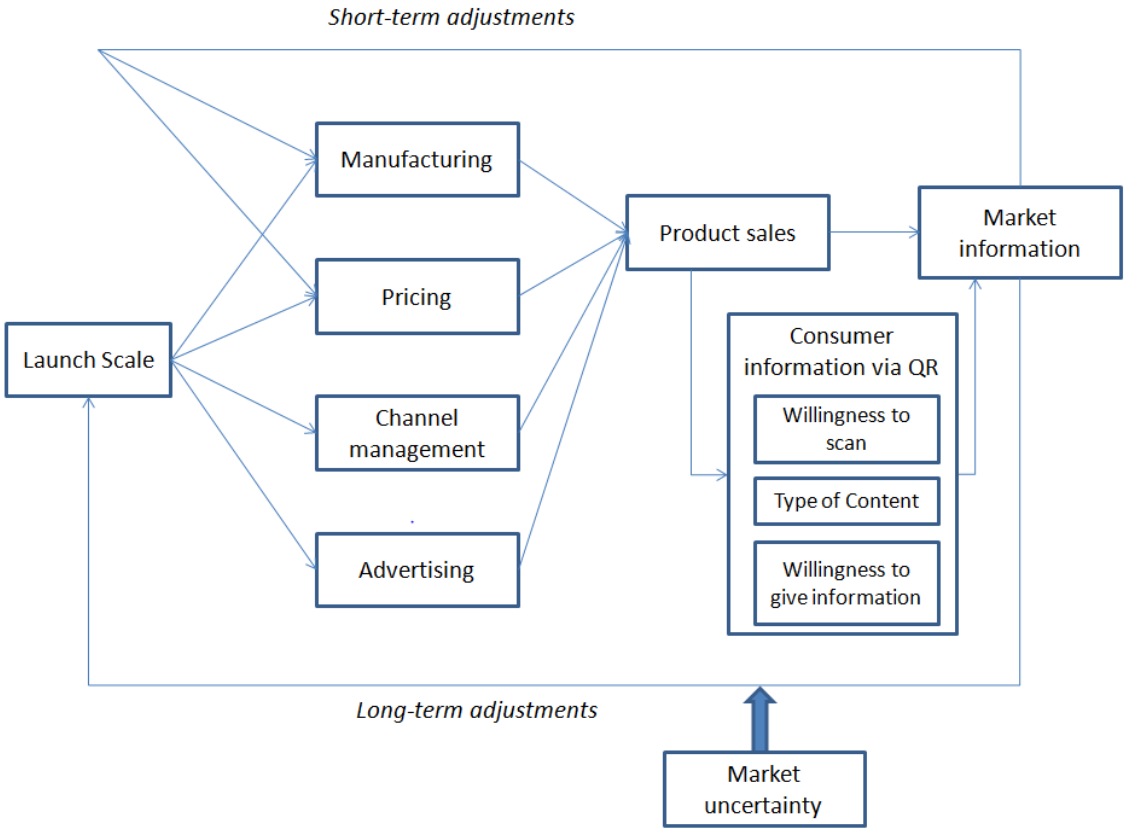

Figure 4. Theoretical framework of the study.

Primary research question:

What prerequisites affect the usability of QR codes as a part of a dynamic launch?

Sub questions:

- What affects consumers' willingness to scan a QR code placed on a package of a newly launched product?
- What type of content do consumers want to find behind a QR code placed on a package of a newly launched product?
- What affects consumers' willingness to give demographic information about themselves through a QR code placed on a package of a newly launched product?

The following chapter presents the methodology of the empirical part of this study.

7 Methodology

7.1 Research Design

Earlier research on QR codes in consumer goods industry has focused on the factors affecting the use of QR codes and the type of content consumers access using QR codes (Watson et al. 2013 and Shin et al. 2012). This study builds on existing research by looking more specifically at the use of QR codes on newly launched products. The purpose of this study is to investigate the usability of QR codes during new product launch: what affects consumers' willingness to scan a code, what type of content they would like to find and what affects their willingness to give personal information through a QR code, when the code is placed on a package of a newly launched food product.

As this study builds on existing research (Watson et al. 2013 and Shin et al. 2012) on using QR codes a conclusive research design was chosen. Conclusive research is often used to test specific hypothesis and examine relationships. Research is considered as conclusive in nature and the results can be used by managers as input to their decision making. Research done using descriptive methods is typically preplanned and conducted through a structured process, where the data is collected from a large sample and analyzed quantitatively. In this study single cross-sectional design will be used, in which information is obtained once from one sample of respondents. (Malhotra 2004, 76-80.)

7.2 Data Collection

The data collection for this study took place in the spring of 2015. Data was collected through a web-based structured survey using Webropol software. The target population of this study was Facebook users that had at the time of the survey in spring 2015 a Facebook account and were able to understand written Finnish as the survey was conducted in Finnish. The sampling frame was the same as target population. Facebook users were chosen as the target population as according to ComScore (2011) statistics there is a positive correlation between the users of interactive Facebook and QR code users. The purpose of this study was to gain insights into the usability of QR codes specifically on newly launched food products as a tool to acquire consumer information, which is why getting answers from those already using QR codes was relevant for the study.

Respondents were contacted both by personal message without friendship request and using wall messages. Personal messages were used in an attempt to minimize the non-response rate and they were sent to both friends of the researcher and non-friends. Wall messages were posted on various social groups in order to reach a wide group of Facebook users from various demographic backgrounds. Sharing of the link to the survey was encouraged in order to reach respondents that have no direct contact to the researcher. Two movie tickets were raffled among the respondents in order to acquire a higher response rate.

7.3 Survey Construction

Survey was chosen as a research design of this study. A structured direct survey method was chosen and a questionnaire was developed with fixed-alternative questions. The method was chosen as with a structured survey it is possible to ask a variety of questions from a large sample of respondents in order to acquire information regarding a specific information need (Malhotra 2004, 168-169). In order to investigate what prerequisites affect the usability of QR codes as a part of a dynamic launch of a new product the factors affect consumers' willingness to scan QR codes on packages of newly launched products needed to be investigated. Also the content consumers wish to find and the factors affecting their willingness to give personal information needed to be understood. The survey was constructed to give insights into these factors, using the information from previous research as a basis for the questions.

The benefits of survey method include time and costs efficiency. Surveys can easily and without costs be distributed to a large sample of respondents and the responses acquired in a fixed format. (Hirsjärvi et al. 2009, 195.) Internet surveys also have the advantage of high perceived anonymity and low risk for interviewer bias and social desirability affecting the answers as there is no face-to-face contact with the interviewer (Malhotra 2004, 183-184). The benefits of using fixed-alternative questions is that it increases the reliability of the answers as responses are limited to the answer alternatives provided (Malhotra 2004, 168-169). The disadvantages of survey method are related to the insecurity about the respondents and their ability and willingness to answer the questions appropriately. Respondents might not be able to answer the questions due to lack of knowledge or might be unwilling to answer the questions carefully. There is also a risk that from a respondent's

point of view the answer options do not reflect the answer they wish to give. If the survey is not well formulated there is a risk for misunderstandings as in case of mail and internet surveys there is mostly no option for the respondents to ask clarifying questions or choose alternatives that are not included in the answer options. (Hirsjärvi et al. 2009, 195.)

Good planning and formulation of a survey questionnaire is vital for the success of the research. Badly formulated questionnaires can result in response errors caused by misunderstandings and other risks mentioned in the previous chapter. (Malhotra 2004, 280-281.) In this study the survey was formulated based on the three sub questions of the research. The survey consisted four parts. The first part of the survey included demographic questions and the respondents were asked whether they had a Facebook account in order to ensure all respondents were part of the target group. The second section focused on finding out whether the respondents are familiar with QR codes and their previous experiences of using the codes. In this section a picture of a QR code was presented to respondents to ensure all respondents were aware of the type of a multidimensional code the questionnaire was about. Factors affecting the use of QR codes were asked in the third section. The last section was about factors affecting the willingness to give personal information.

In the survey Likert Scale was chosen as the scaling technique. Likert scale is a non-comparative itemized rating scale that is commonly used in marketing research. In a Likert scale the respondents choose from typically five categories that indicate their level of agreement with a statement, for example from “strongly disagree” to “strongly agree”. Each statement is assigned a numerical score ranging from 1 to 5 and then analyzes are conducted either on an item-by-item basis or a total. The popularity of Likert scale brings the advantage that respondents are likely to understand how it works and thus it is possible to use in a web-survey. The disadvantages include that it is relatively slow to fill out and there is a risk that respondents might not be careful in filling out a long survey with multiple statements. (Malhotra 2004, 257-259.)

In this study a five category Likert scale was used. It could be assumed already before the research based on the statistics of QR code use that not all of the respondents would be familiar with QR codes so a scale with fewer categories was chosen. The data was used to make broad generalizations so there was no need to use sophisticated statistical techniques

to analyze data of individual responses. As a Likert scale was used the scale was balanced with an odd number of categories and a neutral point. The categories were verbally labeled to reduce ambiguity.

The questions in the survey were mostly adopted from previous research related to QR codes and willingness to give information. The questions were modified to suit the needs of this study. The questions 5-7 in section two related to the familiarity and use of QR codes and questions 9 and 10 in section three were adopted from Watson et al (2013) research on "Consumer attitudes towards mobile marketing in the smart phone era". The original questions and results presented below in figure 5.

Familiarity with QR codes.

Yes I know what they are and I have scanned them before	41.7%
Somewhat: I know what they are but I have never used them	45.5%
Not really: I have seen them but I've no idea what they are	8.6%
No: I have never noticed them before	4.3%

Characteristics of QR code use (%).

What type of content have you accessed via a QR code?	
A link to a discount voucher	28
A link to make a purchase of goods, tickets, etc.	24
A link to enter a competition	18
A link to interactive web content, e.g. a game	36
A link to more information on a website	73
A link to more advertising material	27
A link to a text file	12
A link to a discount voucher	28
On which of the following items have you scanned a QR code?	
From an outdoor advert or poster	53
On a website	30
From a newspaper or magazine advert	60
On a flyer or leaflet	44
On product packaging	34
On a print voucher	17
On clothing	3
Other (please specify)	16
From an outdoor advert or poster	53
Where were you when you scanned a QR code?	
At home	56
At work	42
In the street	58
On public transport	30
In a shop or supermarket	21
In a restaurant	12
In a pub, bar or club	26

Factors likely to promote adoption of QR codes (%). Responses to: would any of the following factors or incentive make you more likely to scan a QR code in future (if your phone had a QR code reader)?.

	Strongly agree (5)	Tend to agree	Neither agree nor disagree	Tend to disagree	Strongly disagree (1)	Mean
Incentives and functions						
To access discount vouchers or special offers	18	55	19	5	4	3.78
To enter competitions for cash rewards or prizes	6	26	26	26	17	2.76
To gain access to information tailored to your local area	9	42	34	11	4	3.42
For instant access to further information on a website	11	28	34	18	8	3.16
For instant access to a service such as buying tickets or signing an online petition	14	47	24	11	5	3.54
Ability to capture contact details easily (e.g.: via QR Codes on business cards)	14	44	24	14	5	3.49
Experiential and relational benefits						
I would be more likely to scan a QR code if I was shown how to do it	18	37	24	9	12	3.40
I would be more likely to scan a QR code if I knew my friends were using them	6	25	41	14	14	2.96
I would be more likely to scan a QR code if it was obvious what the benefits were	23	57	15	2	4	3.94
I would be more likely to scan a QR code if I thought it was safe	30	35	22	4	9	3.73
I would be more likely to scan a QR code if I trusted and liked the company	25	51	13	4	8	
I would be more likely to scan a QR code in my own home rather than in public	11	26	40	16	8	3.16
I would be more likely to scan a QR code if I thought it was easy	21	33	32	4	10	3.51

Figure 5. Questions adopted from Watson et al (2013).

The question 8 related to the ease of use of QR codes was adopted from Shin et al (2012) research "The psychology behind QR codes: User experience perspective". Original question below in figure 6.

PEoU	PEoU1: I find using QR codes to be easy. PEoU2: I find interaction through the QR code system clear and understandable. PEoU3: Overall, QR codes are easy and convenient.	Davis (1989)

Figure 6. Questions adopted from Shin et al (2012).

The question about willingness to give information was adopted from Sultan et al (2009) "Factors Influencing Consumer Acceptance of Mobile Marketing: A Two-Country Study of Youth Markets". Original questions below in figure 7.

I would provide a website with personal information (such as my e-mail address) to receive a small gift. .
I would provide a website with personal information (such as my e-mail address) to enter in a contest. .
I would provide a website with personal information (such as my e-mail address) to receive discounts on future purchases.

Figure 7. Questions adopted from Sultan et al (2009).

The questionnaire was tested by five friends of the researcher to ensure both the questions and response options were understandable. The test respondents were asked to give feedback about the survey and comment on clarity and understandability of the questions. Survey questions were slightly clarified based on the feedback. The questionnaire (in Finnish) can be found in the appendix number 1.

7.4 Analysis Methods

The questionnaire was conducted using a five category Likert Scale. Data received using a Likert Scale is ordinal in nature, which results in that the relative position of objects can be analyzed, but there is no information about the magnitude of the differences between the objects (Malhotra 2004, 237). The questionnaire yielded 104 answers. The data from the questionnaire was first simple analyzed by looking at the percentage division of the responses to different questions and looking at basic descriptive statistics. Then a factory analysis was conducted on the questions related to the content of QR codes that would increase the likelihood of respondents scanning the code and giving personal information through the code (section three of the questionnaire).

Factory analysis is used to reduce data by taking multiple variables and explaining them with a few factors. Each variable gets a factor loading that presents the correlation between variables and the factors. Factor loading values are between -1 and 1 and the closer the value is to -1 or 1 the more the factor correlates with the variable. A negative value refers to negative correlation. Eigenvalue presents how well the variance of the variables is explained by the factor. Communality (h2) refers to how much of the variance of a variable is shared with all other variables being considered. (Malhotra & Birks 2005, 572-573.)

The usability of factor analysis on the data available should be tested to ensure the analysis is applicable and results statistically significant. Kaiser-Meyer-Olkin (KMO) and Barlett's tests were done to assess the data. KMO value should be greater than 0,50 for the analysis to be applicable and Barlett's value less than 0,05 for the results to be statistically significant. (Malhotra & Birks 2005, 651.)

Factor analysis on the questions related to the content that would increase the likelihood of respondents scanning the code gave good results with KMO 0,746 and Barlett's Test significance 0,000. Table 1 on the next page shows the results.

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0,746
Bartlett's Test of Sphericity	Approx. Chi-Square	152,416
	df	15
	Sig.	0,000

Table 1. KMO and Bartlett's Test content of code.

Factor analysis on the questions related to the content that would increase the likelihood of respondents giving personal information through the code also gave acceptable results with KMO 0,700 and Barlett's Test significance 0,000. Table 2 below shows the results.

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0,700
Bartlett's Test of Sphericity	Approx. Chi-Square	174,152
	df	15
	Sig.	0,000

Table 2. KMO and Bartlett's Test giving personal information.

7.5 Validity and Reliability

Validity refers to the ability of the survey to measure the question at hand (Hirsjärvi et al. 2009, 231). In this study literature review was used to establish content validity. Literature review is a common method of determining the domain of construct (Cyr et al. 2009). The questions used in the survey were adopted from previously validated work related to QR codes and willingness to give information and modified to suit the needs of this study. The research from which the survey questions were adopted was covered in the previous chapter 7.3 Survey Construct.

Reliability refers to the extent to which the measurement can be repeated with consistent results so in other words the ability of the measurement to give results free from random error (Hirsjärvi et al. 2009, 231). The reliability of scales used in this research were assessed using Cronbach's alpha. Cronbach's alpha is a way of assessing the consistency of the scales by looking at the correlations of the items in question. It can be used to describe the reliability of questions with two possible answers or questions with multi-point scales such as Likert Scale which was used in this questionnaire. (Malhotra & Birks 2005, 314.) Alpha coefficient values range between 0 and 1 and the higher the value the

more reliable the scale. There are different views on what the acceptable values for alpha are. Nunnally (1994) suggested 0,70 to be the lower boundary for acceptable value.

Reliability was tested on the two different factor analysis. The first analysis on the questions related to the content that would increase the likelihood of respondents scanning the code yielded an acceptable alpha coefficient of 0,746. The items varied in how well they fit in the scale, the differences are presented in the table on the next page. The questions "I would scan a QR code on a new product package if I would get a discount coupon" was the least fitting question and excluding it would rise the Alpha to 0,763. The questions "…if I would get additional product information" and "…if I could communicate with the manufacturer of the product" fitted the best as excluding them would decrease the Alpha < 0,669. The Cronbach's alpha value and how particular questions affect the value are presented on table 3 below.

Reliability Statistics

Cronbach's Alpha	N of Items
0,746	6

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
I would scan a QR code placed on a package of a newly launched product if through the code I could: get a discount coupon	16,59	15,924	0,274	0,763
I would scan a QR code placed on a package of a newly launched product if through the code I could: take part in a competition	17,47	13,211	0,517	0,700
I would scan a QR code placed on a package of a newly launched product if through the code I could: get additional product information	16,82	13,628	0,579	0,683
I would scan a QR code placed on a package of a newly launched product if through the code I could: communicate with other consumers of the product	18,35	14,289	0,422	0,727

I would scan a QR code placed on a package of a newly launched product if through the code I could: communicate with the company that produced the product	17,58	13,165	0,624	0,669
I would scan a QR code placed on a package of a newly launched product if through the code I could: give feedback about the product	16,90	14,610	0,510	0,704

Table 3. Cronbach's Alpha on factors affecting the likelihood of scanning the code.

The second analysis on the questions related to the content that would increase the likelihood of respondents giving personal information through the code also yielded a slightly higher alpha coefficient of 0,784. Also in this case the items varied in how well they fit in the scale. The questions "I would give personal information (such as e-mail address) through a QR code on a new product package if I would get a discount coupon" and "…if the benefits of scanning the code were obvious" were the least fitting questions and excluding them would rise the Alpha > 0,77. The question "…if I could give feedback on the product" fitted the best as excluding them would decrease the Alpha to 0,73. The Cronbach's alpha value and how particular questions affect the value are presented on table 4 below.

Reliability Statistics

Cronbach's Alpha	N of Items
0,784	6

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
I would provide personal information (such as my e-mail address) through a QR code placed on a package of a newly launched product if: I could get a discount coupon	13,32	19,319	0,458	0,770

I would provide personal information (such as my e-mail address) through a QR code placed on a package of a newly launched product if I could: get additional product information	14,29	18,447	0,574	0,741
I would provide personal information (such as my e-mail address) through a QR code placed on a package of a newly launched product if I could: give feedback about the product	13,56	17,848	0,615	0,730
I would provide personal information (such as my e-mail address) through a QR code placed on a package of a newly launched product if I could: communicate with other consumers of the product	15,00	21,620	0,424	0,776
I would provide personal information (such as my e-mail address) through a QR code placed on a package of a newly launched product if I could: communicate with the company that produced the product	13,90	18,210	0,570	0,742
I would provide personal information (such as my e-mail address) through a QR code placed on a package of a newly launched product if I could: take part in a competition	13,74	18,193	0,562	0,744

Table 4. Cronbach's Alpha of factors affecting the likelihood of giving personal information.

8 Results

8.1 Demographic Variables of the Respondents

The questionnaire was answered by 104 respondents. Facebook users were chosen as the target population of the study. Three respondents indicated that they did not have a Facebook profile so their answers were excluded from the results and thus the final results included answers from 101 respondents. An overview of the demographics of the respondents will be presented in this chapter.

The results indicated that 100 % of the respondents were female which cannot be accurate as the personal details given in order to take part in the raffle indicate that also males were part of the sample. Based on this potential risk of incorrect answers it was decided to exclude gender from the demographics. Respondents were mainly from the capital region with 82 % being from Helsinki, Espoo and Vantaa. Due to this the results of this study cannot be generalized to the whole country or used to assess the differences that might appear between capital region and the rest of the country. The table 5 below shows the geographical background of the respondents.

Place of Residence	Nr. Respondents
Blank	1
Bordeaux/Helsinki	1
Borgnäs	1
Espoo	18
Helsinki	63
Järvenpää	3
Lahti	1
Lappeenranta	1
Lempäälä	1
Mikkeli	1
Naantali	1
Seinäjoki	1
Sipoo	1
Turku	3
Tuusula	1
Vantaa	3

Table 5. Geographical background of the respondents.

The respondents represented a wide variety of different ages with the age of the respondents ranging from 16 to 61, with three blank answers and one faulty answer of age

of 3 excluded from the age range. Despite the wide range there is a clear emphasis on the lower ages of the range with 60 % of respondents being between ages of 20 and 29 years old. This is likely to affect the results as there are differences with the scanning rates of QR-codes within different age groups. According to ScanLife statistics most QR-code scans were done by 35-44 year olds (25 %) followed by 23-34 year olds (22 %). (ScanLife.com 2014.) Figures 8 and 9 below present the age of respondents.

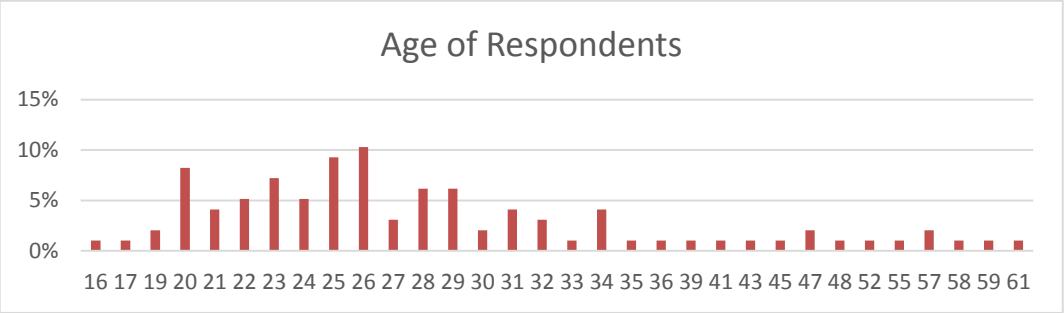

Figure 8. Range of Age of Respondents.

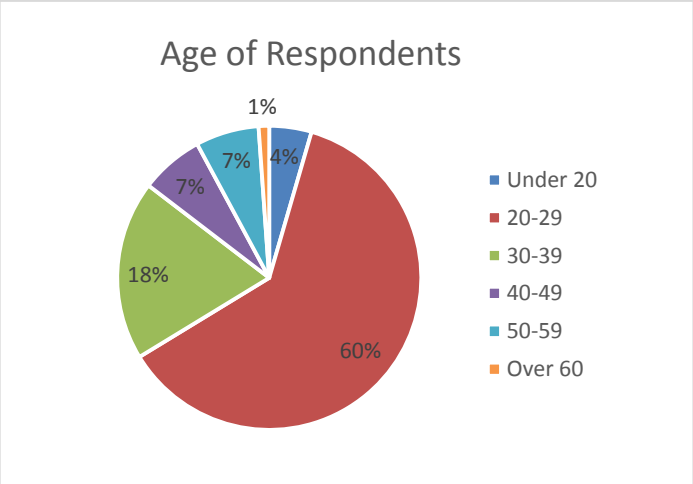

Figure 9. Age of Respondents.

Educational background of the respondents is presented in the figure 10 on the next page. 71 % of the respondents had an undergraduate or graduate degree.

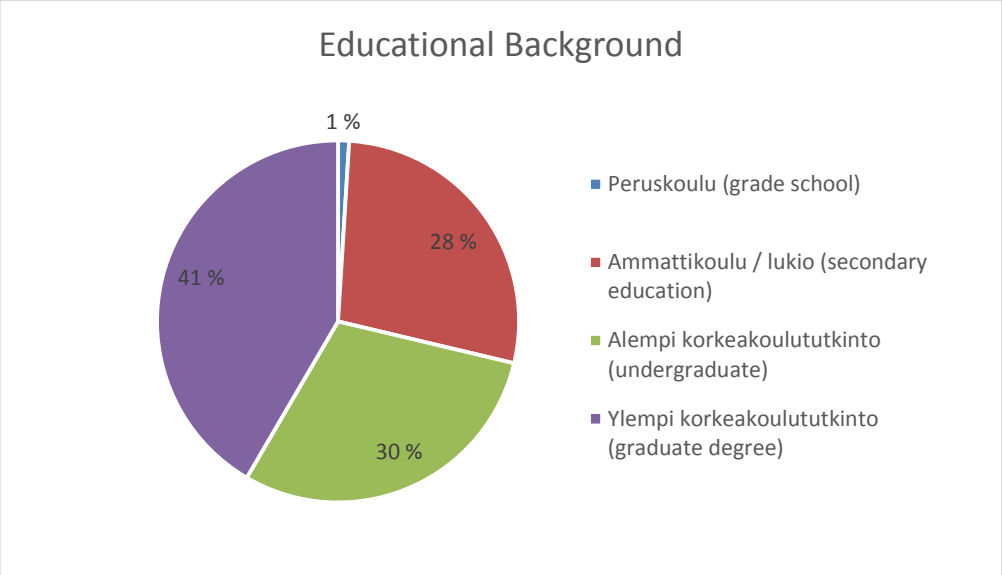

Figure 10. Educational Background.

From the overview it can be seen that the demographics of the researcher has affected the demographics of the respondents. The respondents were contacted by the researcher in Facebook both by personal message without friendship request and using wall messages. The respondents were encouraged to share the link in order to acquire respondents with no direct contact with the researcher. Despite the multiple methods of contacting respondents still many respondents were similar in demographics to the researcher. This imposes restrictions into generalization of the results and further research is needed in order to acquire understanding of how the results vary between different demographic groups.

8.2 Previous Knowledge of QR Codes

According to ComScore (2011) statistics there is a positive correlation between the users of Facebook and QR code users. Due to this correlation Facebook users were chosen as the target population of this study and as expected the respondents were aware of what QR codes are. 100 % of the respondents had seen QR codes before, 97 % knew what they are and 57 % had used them before. QR codes were most commonly used by the respondents to access additional information on a webpage, which is in line with findings from comScore (2012) and Watson et al. (2013). Also accessing advertising material, buying a product and discount coupons were common contents accessed by those who had used QR codes. QR codes were scanned from different places and 25 % of the respondents replied to have scanned a code from a product package. Figure 12 below presents the respondents'

previous knowledge of QR codes and tables 6 and 7 the content accessed and where codes have been scanned from.

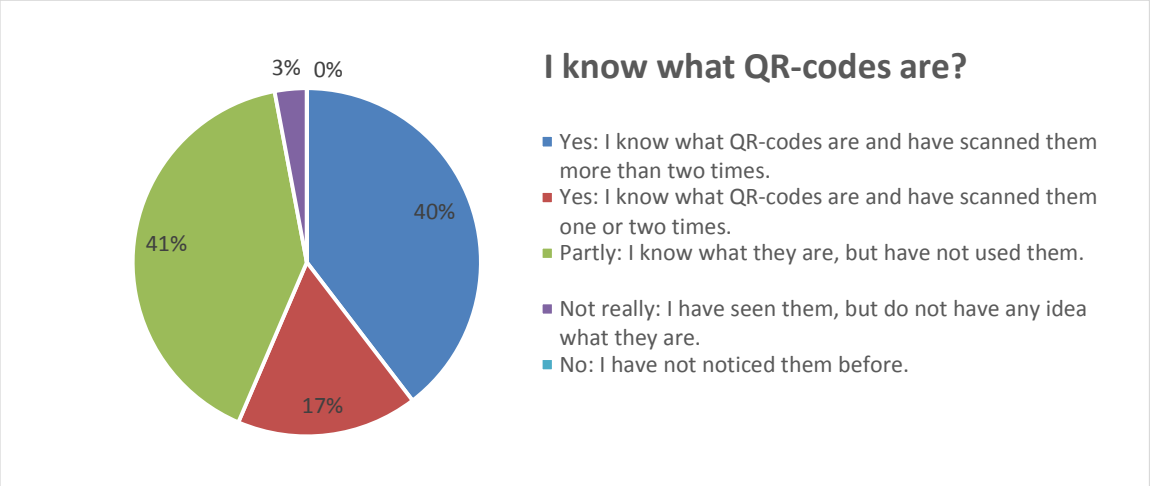

Figure 11. Previous knowledge of QR-codes.

What content have you accessed through a QR-code?	
Link to a discount coupon	17
Link to buy a product: ticket etc.	18
Link to participate in a competition	13
Link to an interactive internet content: game etc.	11
Link to additional information on a webpage	42
Link to an advertising material	20
Link to a text file	9
Something else	13

Table 6. Type of Content Accessed through QR-codes.

From which of the following objects have you scanned a QR-code from?	
Outdoor advertisement or poster	25
Webpage	10
Newspaper or magazine advertisement	28
Flyer	26
Product package	25
Printed discount coupon	8
Clothing	2
Other	6

Table 7. QR-code placement.

Perceived ease of use was suggested by Shin et al. (2012) to be a factor affecting consumers' willingness to start using QR-codes. Three questions were used to assess the ease of use of QR-codes: "The use of QR-codes is easy", "Interaction through the QR code system is easy and understandable" and "In general QR codes are ease and convenient". 42-51 % of the respondents indicated through the three questions that they find the use of QR codes easy and 16-20 % of the respondents indicated the opposite. Figure 12 below presents the results.

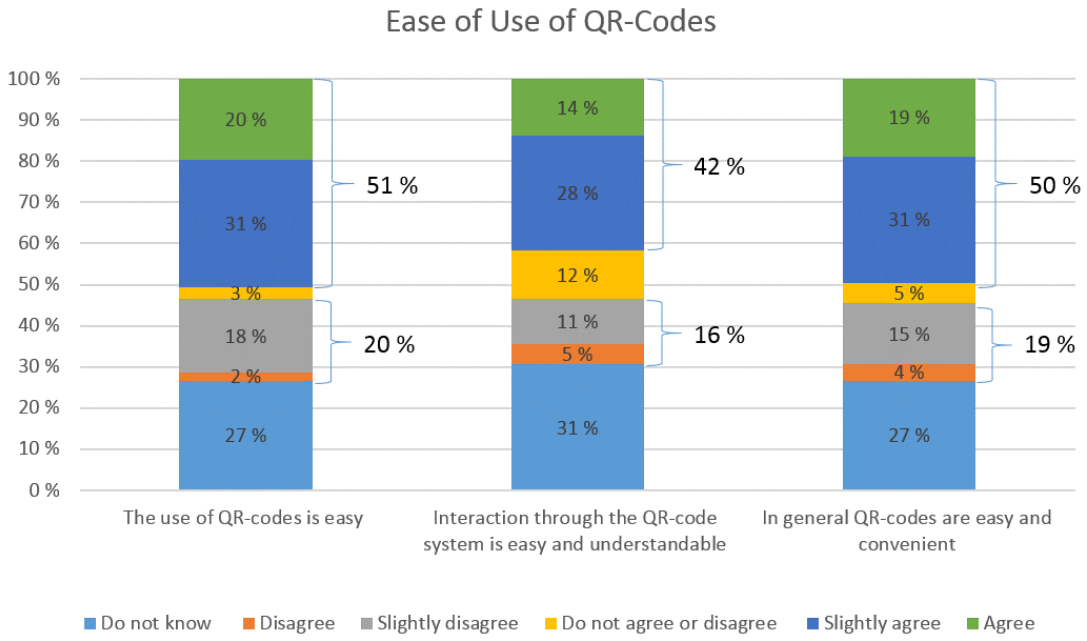

Figure 12. Ease of use of QR-codes.

8.3 Factors Affecting the Likelihood of Scanning QR Codes

8.3.1 Ease of Use

To understand the prerequisites that affect the usability of QR codes as a part of dynamic launch model the factors affecting consumers' willingness to scan the code were studied. The respondents were asked about factors that could affect their likelihood of scanning the code. As covered in the previous section only about half of the respondents indicated scanning of QR codes to be easy and in the next section of the survey the ease of use was further investigated. Using an adopted question form Wattson et al (2013) research the respondents were asked if they would be more likely to scan a QR code on a new product package if they were shown how to do it, if they believed the scanning to be easy or if the

benefits of scanning the code would be obvious. The results showed that 34 % of respondents indicated that they would be more likely to scan a QR code on a new product package if someone showed them how to do it and 71 % if they believed the scanning to be easy. This finding is slightly contradicting to the findings of the question of how respondents perceive the ease of use as 51 % of them indicated that they find the scanning of a QR code to be ease. 90 % of the respondents said that they would be more likely to scan a QR code on a new product package if the benefits of scanning the code would be apparent. The last option had clearly the highest mean of 4,49 (maximum 5) and low standard deviation of 0,820.

These result highlight the importance of communicating the benefits of scanning the code in motivating consumers to scan QR codes. This is in line with Wattson et al. (2013) research where some of the most commonly mentioned reasons for not using QR codes were that "they are not aware of the benefits to scanning a QR code" (33 %) and "they have never been shown how to scan a QR code" (23 %). They also found that reasons for not scanning a QR code again were that "most QR codes don't seem to offer any benefits or incentives to bother scanning them". Making sure that there is clear added value for consumer and clearly communicating what that value is has also been agreed by marketing professionals to be important factors to consider when using QR codes (NearMe Services 2013). Figure 14 below presents the results. IPM SPSS Modeler was used to analyze the mean and standard deviation of the various content, results are presented on table 8 on the next page.

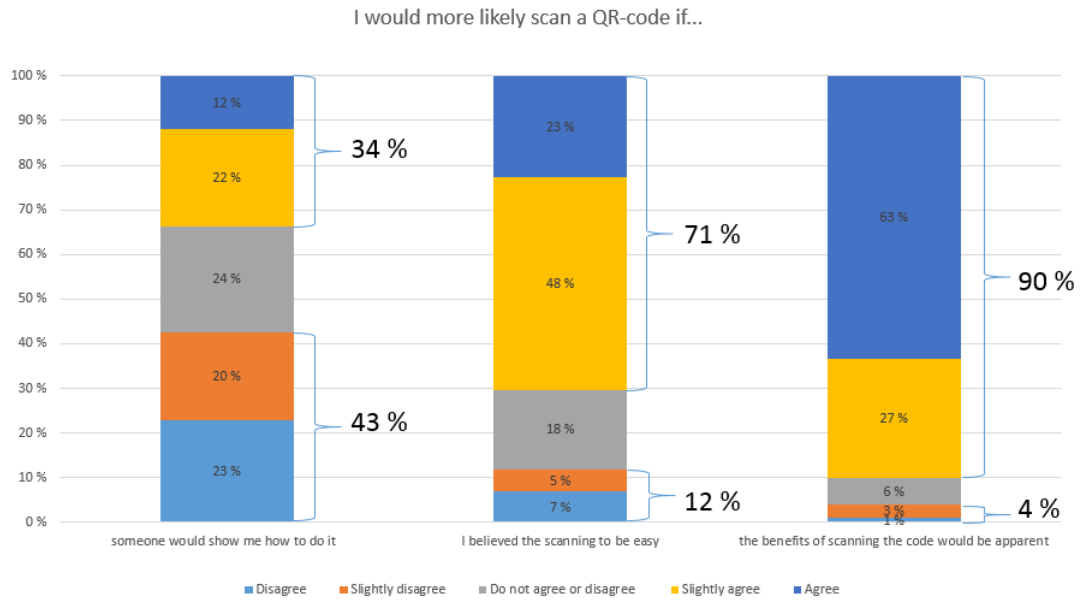

Figure 13. Factors affecting scanning QR codes part 1.

Descriptive Statistics

	N	Mean	Std. Deviation
I would be more likely to scan a QR code on a package of a newly launched product if: I was shown how to do it	101	2,80	1,334
I would be more likely to scan a QR code on a package of a newly launched product if: I thought it was easy	101	3,74	1,083
I would be more likely to scan a QR code on a package of a newly launched product if: it was obvious what the benefits are	101	4,49	0,820

Table 8. Descriptive statistics on ease of use.

8.3.2 Content of Codes

In addition to ease of use of QR code other factors affecting the likelihood of scanning a QR code on a new product package were investigated. Using previous knowledge of statistics of QR code use and Wattson et al. (2013) research, respondents were asked about six potential benefits that could have an effect on their likelihood of scanning a QR code: receiving a coupon, taking part in a competition, getting more information about the product, communicating with other consumers of the product, communicating with the manufacturer of the product and giving feedback about the product. Results are presented on figure 14 on the next page and descriptive statistics are presented on table 9.

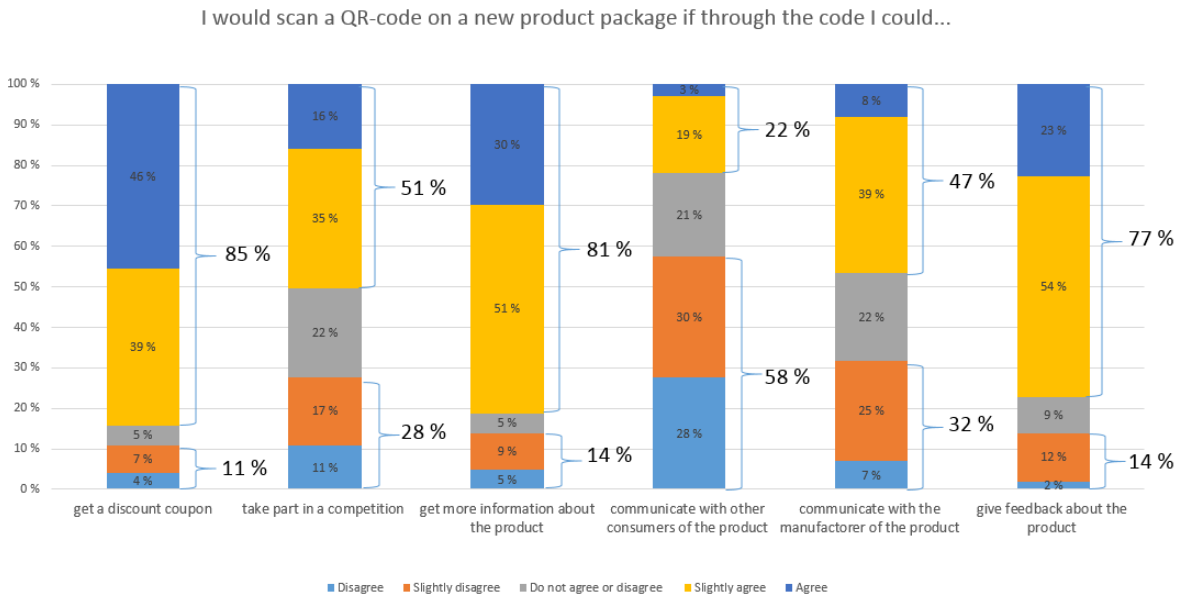

Figure 14. Factors affecting scanning QR codes part 2.

Descriptive Statistics

	N	Mean	Std. Deviation
I would scan a QR code placed on a package of a newly launched product if through the code I could: get a discount coupon	101	4,15	1,062
I would scan a QR code placed on a package of a newly launched product if through the code I could: take part in a competition	101	3,28	1,234
I would scan a QR code placed on a package of a newly launched product if through the code I could: get additional product information	101	3,92	1,074
I would scan a QR code placed on a package of a newly launched product if through the code I could: communicate with other consumers of the product	101	2,40	1,167
I would scan a QR code placed on a package of a newly launched product if through the code I could: communicate with the company that produced the product	101	3,16	1,102
I would scan a QR code placed on a package of a newly launched product if through the code I could: give feedback about the product	101	3,84	0,977
Valid N (listwise)	101		

Table 9. Descriptive statistics on the content of codes.

The results indicate that getting a discount coupon could work as a good incentive to scan a code. 85 % of respondents slightly agree or agree with the statement and the option had clearly the highest mean of 4.15. This suggests that the respondents see a discount coupon as a clear benefit. Taking part in a competition was seen by 51 % of the respondents as a factor that would get them to scan a code, but the result yielded the third lowest mean of 3,28. Results also suggest that getting more information about the product (81 %, second highest mean of 3,92) could motivate consumers to scan a QR code on a new product package. A challenge with product packages is the limited space on the package and consumers have been found to be interested in having clearer information on the package (Hyvönen et al. 2008). The results suggest that QR code could be used as a tool to give additional product information to the consumers. These results are in line with the comScore (2012) statistics of QR code use and the findings of research done by Wattson et al. (2013).

Shin et al. (2012) suggested that the perceived interactivity of the code could be a factor affecting consumers' willingness to scan a QR code. Respondents were asked about three benefits linked to the interactive nature of the QR codes: opportunity to communicate with other consumers of the product, communicate with the producer of the product and to give feedback about the product. Out of the three aspects the possibility to give feedback about the product was the only one that was by a clear majority of the respondents (77 %, mean third highest 3,84) seen as a factor that would get them to scan a code. Festinger (1957) proposed in his theory that those experiencing post purchase cognitive dissonance would be motivated to attempt to reduce it. Further research suggests that post-purchase communication that provides re-assurance of the purchase choice can be used to reduce this dissonance (Milliman & Decker 1990). The findings of this study that suggest that consumers would scan a QR code on a new product package to get additional product information and give feedback about the product. This could provide producers a way to give relevant post-purchase information and for the consumers a way to reduce possible cognitive dissonance by getting additional information that would re-enforce their buying decision and on the other give feedback about possible aspects of the product that they are not happy with.

Shin et al. (2012) suggested that the role of interactivity in the use of QR codes might indicate that proactive consumers want to interact with producers in a new way. QR code can offer great potential in creating new ways for consumers and producers to interact and communicate. In this study only 22 % of the respondents indicated that they would scan a QR code on a new product package if they could be in contact with other consumers of the product, where as 58 % indicated the opposite. On the other hand 47 % of respondents would scan a QR code to be in contact with the manufacturer of the product, with 32 % not scanning the code for the purpose. These two were the options with the lowest mean values of 2,40 and 3,16 respectively.

To further analyze the results related to the content of the code a factor analysis was conducted. Two factors had Eigenvalues higher than one and those three factors explain together 66,250 % of the variance. Tables 10 and 11 present the results of the factor analysis.

Total Variance Explained

	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2,899	48,310	48,310	2,899	48,310	48,310	2,206	36,770	36,770
2	1,016	16,941	65,250	1,016	16,941	65,250	1,709	28,481	65,250
3	0,748	12,471	77,721						
4	0,645	10,742	88,463						
5	0,397	6,610	95,073						
6	0,296	4,927	100,000						

Extraction Method: Principal Component Analysis.

Table 10. Factor analysis on content of codes, variance.

Rotated Component Matrix[a]

	Component	
	1	2
I would scan a QR code placed on a package of a newly launched product if through the code I could: communicate with the company that produced the product	0,848	
I would scan a QR code placed on a package of a newly launched product if through the code I could: give feedback about the product	0,803	

I would scan a QR code placed on a package of a newly launched product if through the code I could: communicate with other consumers of the product	0,709	
I would scan a QR code placed on a package of a newly launched product if through the code I could: get additional product information	0,583	0,490
I would scan a QR code placed on a package of a newly launched product if through the code I could: get a discount coupon		0,869
I would scan a QR code placed on a package of a newly launched product if through the code I could: take part in a competition	0,302	0,770

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 3 iterations.

Table 11. Factor analysis on content of codes, rotated component matrix.

The first factor has high loadings on variables related to interaction: opportunity to communicate with the producer of the product (0,848), give feedback about the product (0,803) and communicate with other users of the product (0,709 and the factor could be named as "interaction". The interaction factor explains 48,31 % of the variance. The second factor explains 16,941 % of the variance and has high loadings on variables related to financial benefits of scanning the code and could be named as such: getting a discount coupon (0,869) and taking part in a competition (0,77).

8.4 Giving Personal Information through QR codes

The last section of the survey looked at factors that affect respondents' willingness to give personal information about themselves (such as an e-mail) through a QR code placed on a package of a newly launched food product. Sultan et al. (2009) suggested that in order to facilitate consumers to give personal information producers need to recognize the trade-offs consumers may make concerning risk tolerance and give consumers meaningful incentives and benefits to facilitate these trade-offs. They found economic incentives such as offers to be likely to enhance risk acceptance that positively correlates with willingness

to share personal information. In the survey respondents were asked whether factors that have been found to facilitate scanning QR codes would motivate respondents to give personal information about themselves. These factors included both economic and other incentives. The results are presented on figure 15 below and table 12 presents the descriptive statistics.

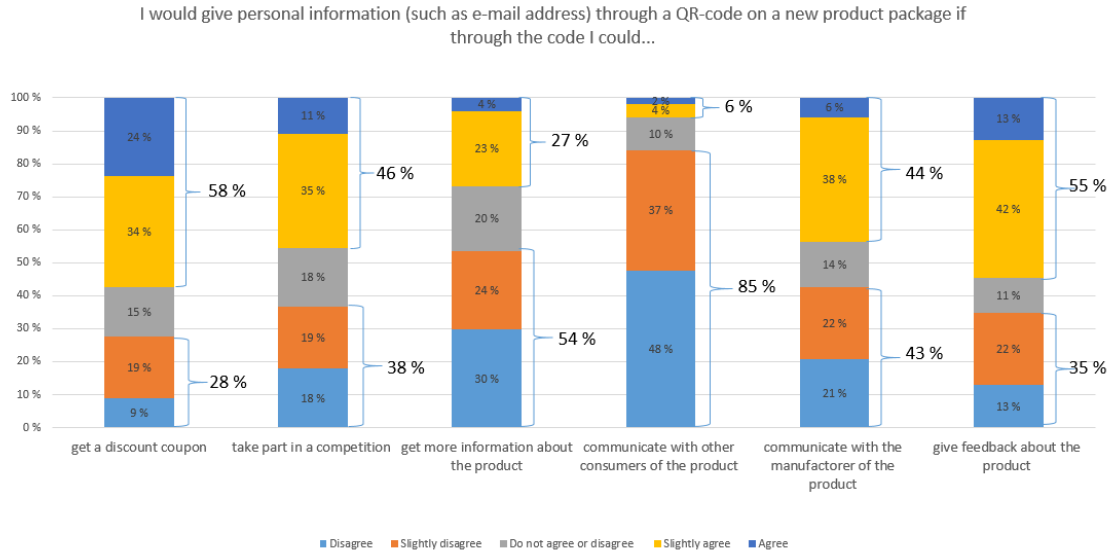

Figure 15. Factors affecting giving personal information through QR code.

Descriptive Statistics

	N	Mean	Std. Deviation
I would provide personal information (such as my e-mail address) through a QR code placed on a package of a newly launched product if: I could get a discount coupon	101	3,45	1,284
I would provide personal information (such as my e-mail address) through a QR code placed on a package of a newly launched product if I could: get additional product information	101	2,48	1,246
I would provide personal information (such as my e-mail address) through a QR code placed on a package of a newly launched product if I could: give feedback about the product	101	3,20	1,281

I would provide personal information (such as my e-mail address) through a QR code placed on a package of a newly launched product if I could: communicate with other consumers of the product	101	1,76	0,929
I would provide personal information (such as my e-mail address) through a QR code placed on a package of a newly launched product if I could: communicate with the company that produced the product	101	2,86	1,289
I would provide personal information (such as my e-mail address) through a QR code placed on a package of a newly launched product if I could: take part in a competition	101	3,02	1,304
Valid N (listwise)	101		

Table 12. Descriptive statistics on giving personal information through QR code.

The results suggest that none of the factors are very strong incentives in giving personal information. Getting a discount coupon was indicated by 58 % of the respondents to be a motivator to give personal information. As in the previous question on content of codes that could motive to scan a QR code, the discount coupon also received the highest mean of 3,45 in the type of content that would increase the likelihood of the respondents for giving personal information through the code. Giving feedback (55 %) and taking part in a competition (46 %) were also seen by many of the respondents as motivators and had the highest mean value of 3,20 and 3,02. In line with the results of the earlier section of the study that investigated consumers motivators to scan the code the opportunity to communicate with other consumers of the product was not seen as a factor to motivate giving personal information. Shin et al. (2012) suggested that the role of interactivity in the use of QR codes might indicate that proactive consumers want to interact with producers in a new way. Even though 85 % indicated that the opportunity to communicate with other consumers would not work as an incentive to give personal information (very low mean of 1,76), 44 % suggested that opportunity to communicate with the producer would. Getting more information about the product was seen as 81 % as an incentive for scanning the code, but only 27 % (mean 2,48) of the respondents see it as an incentive for providing personal information. Giving feedback about the product was seen by 71 % (mean 3,84) as an incentive to scan a code and by 55 % (low mean of 2,48) as an incentive to give personal information.

Factor analysis was conducted also on these questions. There are two factors with Eigenvalues over one that together explain 65,25 % of the variance. Tables 13 and 14 below present the results of the factor analysis.

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2,899	48,310	48,310	2,899	48,310	48,310	2,206	36,770	36,770
2	1,016	16,941	65,250	1,016	16,941	65,250	1,709	28,481	65,250
3	0,748	12,471	77,721						
4	0,645	10,742	88,463						
5	0,397	6,610	95,073						
6	0,296	4,927	100,000						

Extraction Method: Principal Component Analysis.

Table 13. Factor analysis on giving personal information.

Rotated Component Matrix[a]

	Component	
	1	2
I would provide personal information (such as my e-mail address) through a QR code placed on a package of a newly launched product if I could: communicate with other consumers of the product	0,760	
I would provide personal information (such as my e-mail address) through a QR code placed on a package of a newly launched product if I could: communicate with the company that produced the product	0,748	
I would provide personal information (such as my e-mail address) through a QR code placed on a package of a newly launched product if I could: get additional product information	0,737	
I would provide personal information (such as my e-mail address) through a QR code placed on a package of a newly launched product if I could: give feedback about the product	0,662	0,398
I would provide personal information (such as my e-mail address) through a QR code placed on a package of a newly launched product if: I could get a discount coupon		0,892
I would provide personal information (such as my e-mail address) through a QR code placed on a package of a newly launched product if I could: take part in a competition		0,797

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 3 iterations.

Table 14. Factor analysis on giving information, rotated component matrix.

The factors in the questions related to the content of the code in increasing the likelihood of respondents giving personal information are similar to those of the previous section. In this case there are also two factors with Eigenvalue over one. The first factor has high loadings on variables related to interaction and information: opportunity to communicate with other users of the product (0,760), opportunity to communicate with the producer of the product (0,748) and get more information about the product (0,737) The factor could be named as "interaction and information". The interaction factor explains 48,31 % of the variance. The second factor could be named as financial benefits as it has high loadings on variables getting a discount coupon (0,892) and being able to take part in a competition (0,797).

9 Concluding Remarks

9.1 Discussion and Conclusions

The purpose of this study was to investigate the potential of using QR codes as a part of a dynamic launch. A big portion of new products fail within first few years of launch (Sivadas & Dwyer 2000) and lack of market understanding is a commonly mentioned cause (Baker & Hart 1999, 356). Speeding to market (Johnson et al. 2009) and market orientation (Slater & Narver 1994) has been suggested to be factors positively affecting new product success. Cui et al. (2011) dynamic launch model, presented in chapter 2.3, focused on gaining timely market information during a launch phase of a new product and using that information to adjust the launch to better fit the market demand. Dynamically adjusting launches could enable companies to move to launch phase of a product faster and speed up the new product development process and at the same time taking market information into consideration. Cui et al. (2011) model focused on acquiring this market information in traditional ways by analyzing sales. This thesis looked at the potential of using QR codes as a way to acquire consumer information that could be used in addition to product sales data as an input into making adjustments to the launch strategy.

New technologies offer new ways of interacting with consumers. In order for companies to be able to utilize these technologies as tools in acquiring consumer information the perquisites for using the technologies need to be understood. This thesis focused on QR codes and the perquisites that affect their potential use on a package of a newly launched

product: what affects consumers' willingness to scan a QR code on a package of a newly launched product, what type of content consumers want to find and what content would increase the likelihood of consumers' willingness to give demographic information about themselves. The results of this study give insight into the usability of QR codes, but due to the skewed demographic background of the respondents more research is needed before generalizations can be made.

Shin et al. (2012) suggested that as with new technologies in general perceived ease of use and perceived usefulness of QR codes affects consumers' willingness to start using them. The results of this study support those findings. Most of the respondents of this study had previous knowledge of QR codes and 57 % experience in using them. Around the same amount of participants indicated that they find using QR codes easy, which could have affected their use of codes. A clear majority (71 %) indicated that they would be more likely to scan a QR code if they believed the scanning to be easy. This suggests that improvements in making the use of QR codes easier could increase the use of QR codes. Such improvements could be related to the usability of the code from the technological perspective, for example developing new apps with better functionality, or to the communication about how to scan QR codes.

In addition to ease of use marketing professionals and previous research (Watson et al. 2013) has highlighted the importance of benefits in motivating consumers to scan QR codes. This research looked at different types of content to develop better understanding of what Finnish consumers see as content that would increase their likelihood of scanning QR codes on new product packages. The benefits could be grouped into benefits related to interaction and financial benefits. The results suggest that both financial benefits researched, getting a discount coupon and being able to take part in a competition, could work as incentives for consumers, with coupon as a stronger incentive. This finding suggests that also other forms of financial benefits might be relevant incentives for consumers and various forms of financial benefits could be further investigated. From the benefits related to interaction getting more information and giving feedback about the product are benefits that would increase the likelihood of consumers scanning QR codes. This is an interesting finding as the opportunity to get feedback from the consumers about a newly launched product could be valuable to companies. If the feedback is relevant it could potentially also be used as an input into adjusting the launch strategy even if it is not

related to consumer information. The findings suggest that the opportunity to communicate with other consumers is not seen as a clear benefit whereas the opportunity to communicate with the producer of the product could be a benefit, but not a strong one. Based on the results it can be suggested that the content that consumers would like to find behind a QR code placed on a new product package include a discount coupon, more information about a product or an opportunity to give feedback about the product.

For companies to be able to use QR codes on newly launched product packages for the purpose of getting consumer information that could be used to adjust a launch it is not enough to understand what content motivates consumers to scan a code. In addition to getting consumers to scan a code the incentives that get consumers to give personal information need to be understood. Results suggest that neither financial benefits nor interaction benefits are strong incentives for consumers to give personal information through a QR code. This indicates that either consumers are not willing to give personal information through a QR code on a newly launched product or the incentives should be more significant in their perspective. Out of the contents taken into consideration in this research getting a discount coupon was the strongest incentive also in giving personal information, followed by being able to give feedback about the product and being able to take part in a competition. Discount coupon and the opportunity to give feedback facilitate both scanning QR code and giving personal information through the code suggesting that those contents could be used when QR codes are used as a part of a dynamic launch. This indicates that stronger financial benefits could be an area to look more into as an incentive to give personal information. Strong financial benefits might facilitate the trade-offs consumers may make concerning risk tolerance.

The findings of this study suggest that QR codes could be used as a part of a dynamic launch to acquire consumer information if stronger benefits for giving personal information are found. Consumers can be motivated to scan QR codes on new product packages by offering real benefits for scanning the code and ensuring that scanning is easy. Financial benefits such as getting a discount coupon could work as a benefit for both scanning the code and giving personal information. However the benefits for giving personal information need to be stronger and further research should be conducted in order to find content that is a strong incentive for both scanning a code and giving personal information.

9.2 Managerial Implications

QR codes offer companies opportunities for interacting with consumers in new ways. This interaction could be used to acquire consumer information in a new way and improve timely market understanding. Using QR codes on product packages requires companies to pay attention to the ease of use of the code and the content they offer. As the QR code technology is not the core business of most companies what the companies should focus on is the communication aspect. Companies could use various forms of communication in guiding consumers in using the code and in that way facilitating the use.

In addition to communicating about how to use the code companies should communicate to consumers what the benefits are for scanning the code. This communication should preferably be placed close to the the code on the package to ensure the benefits are apparent. Benefits offered should be ones that add real value to the consumer. If companies only look for getting consumers to scan a code on a new product package for the purpose of activating consumers to visit a web page etc. giving discount coupons, providing more information about a product or providing an opportunity for consumers to give feedback about the product are benefits that can be used to facilitate the use. From a company perspective the indication that consumers would be facilitated to scan a code to give feedback about the newly launched product is potentially interesting. This suggests that QR code could offer an easier and quicker way of getting feedback about a new product straight from the consumer who has been in contact with the actual product. Attention should be paid to what sort of feedback is requested to ensure it is valuable to consumer and could be used to develop the product or adjust the launch.

QR codes could be used to acquire personal information if strong incentives are given to consumers. There might be differences between products and companies regarding consumers' willingness to give personal information and also the type of information they are willing to give. Based on the results of this study it cannot be clearly indicated what benefits are strong enough to work as incentives for giving personal information. However feedback about the product is something that companies could acquire through a QR code and use that to dynamically adjust a launch. For companies to be able to utilize product

feedback acquired they need to focus on the type of feedback they collect from consumers to ensure it is relevant input into a dynamically adjusting a launch.

9.3 Limitations and Future Research

This research provided insights into the potential of using QR codes as a part of a dynamic launch to acquire consumer information. More research is how ever needed in order to further develop the understanding of the perquisites that affect QR codes use to acquire consumer information.

The demographic background of the respondents was not diverse enough for the results to be generalized to all Finnish Facebook users. The demographic background of the respondents was similar to that of the researcher. This was probably due to the way of contacting participant in Facebook and even though effort was made to reach non-friends of the respondent more attention should have been paid on it. 60 % of the participants were between the ages of 20-29 and 71 % of the respondents had an undergraduate or graduate degree. Due to error in the results no information about the gender of the participants was acquired. These are all factors that could affect the results and further research should be conducted to acquire generable data and understanding of how different age groups and people from different educational background are motivated to scan codes and give personal information. Most of the respondents were from the capital region and from big cities which also proposes a limitation to the generalization of the results.

This research did not take into consideration the type and price of product or package in question. Consumers might be interested in different types of content depending on what type of a product is in question. Buying behaviors have been found to vary depending on the type and price of the product. For example in case of complex buying behavior consumers are willing to spend more time and effort on the buying process and could be motivated to look for further product information. In more routine habitual buying behavior consumers are typically making buying decisions quicker and respond to price and sales promotions. (Kotler & Armstrong 2006, 154-155.) Also the innovativeness of the new product might have an effect on the content consumers want to find. The type of the product could therefore affect the buying behavior occurring which in turn might affect the content that would motivate consumers to scan QR codes and give personal information.

Sultan et al. (2009) suggested that trust is a key factor in getting consumers to access contents and share information. Consumers' willingness to give personal information might be affected by the company in question. Further research should be conducted on how the company producing the new product affects the type of content consumers want to find and what motivates them to give personal information to the company. This research also did not take into consideration how the type of personal information requested affects consumers' willingness to give personal information. This should be further investigated as the type of information is very relevant in determining if the information acquired actually provides useful input to the dynamic launch model. Information such as e-mail, which was used as an example of personal information in this study, does not alone provide useful information in perspective of factors affecting the scale of the launch.

QR codes were investigated in this research, but as new technologies are developed further research should be conducted on the potential using other technologies as a part of a dynamic launch. Consumers might have different perspectives on the ease of use of different technologies. Also the perspective on the risks related to sharing personal information might vary depending on the technology used. To be able to utilize the interactive nature of new technologies to acquire timely consumer information more research should be conducted in order to understand which technology is most applicable for that purpose. New technologies provide interesting opportunities and potentially ways of improving the new product success, but further research is needed in order to be able to fully utilize them efficiently as part of a dynamic launch process.

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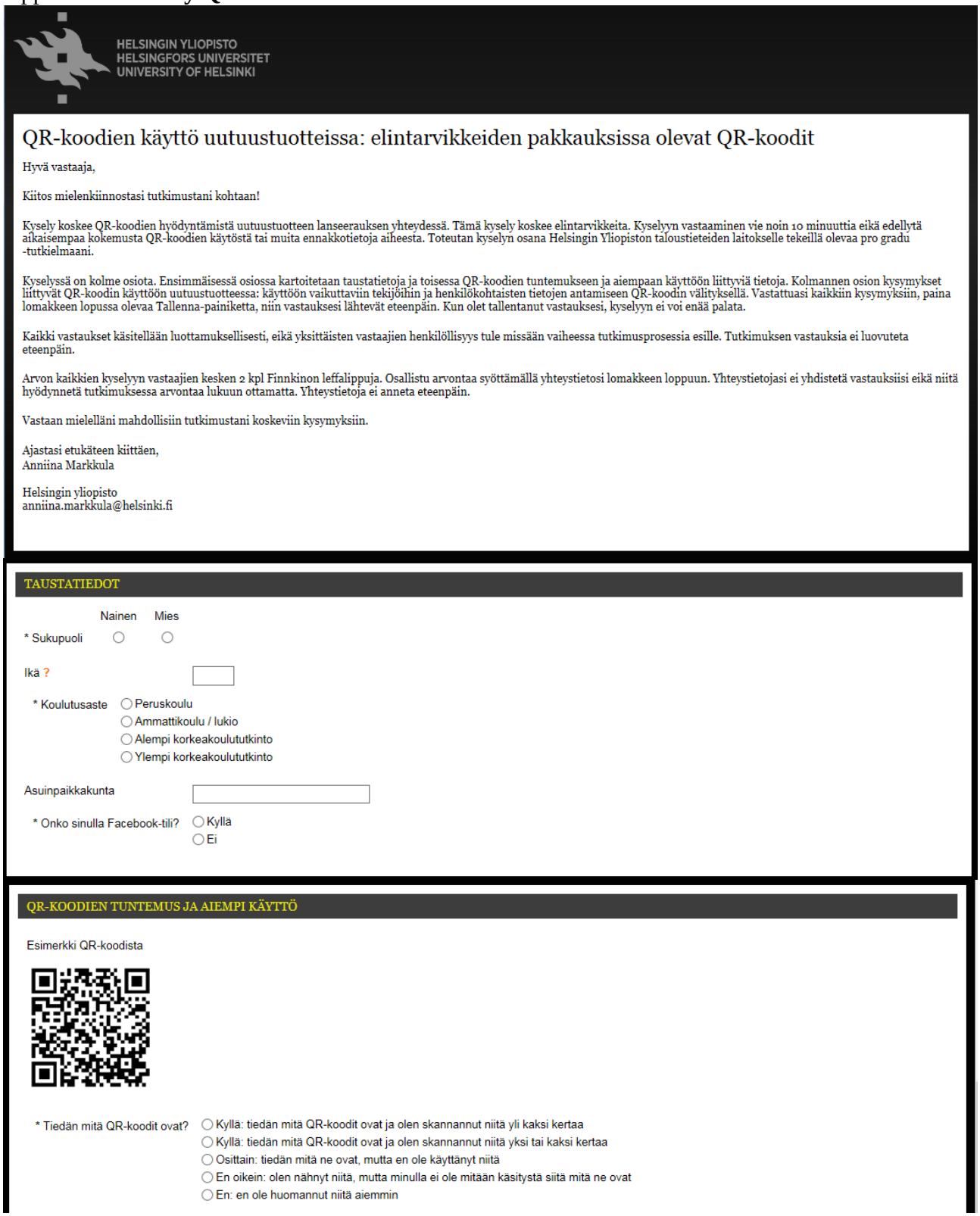
11 Appendixes

Appendix 1 **Survey Questionnaire**



HELSINGIN YLIOPISTO
HELSINGFORS UNIVERSITET
UNIVERSITY OF HELSINKI

QR-koodien käyttö uutuustuotteissa: elintarvikkeiden pakkauksissa olevat QR-koodit

Hyvä vastaaja,

Kiitos mielenkiinnostasi tutkimustani kohtaan!

Kysely koskee QR-koodien hyödyntämistä uutuustuotteen lanseerauksen yhteydessä. Tämä kysely koskee elintarvikkeita. Kyselyyn vastaaminen vie noin 10 minuuttia eikä edellytä aikaisempaa kokemusta QR-koodien käytöstä tai muita ennakkotietoja aiheesta. Toteutan kyselyn osana Helsingin Yliopiston taloustieteiden laitokselle tekeillä olevaa pro gradu -tutkielmaani.

Kyselyssä on kolme osiota. Ensimmäisessä osiossa kartoitetaan taustatietoja ja toisessa QR-koodien tuntemukseen ja aiempaan käyttöön liittyviä tietoja. Kolmannen osion kysymykset liittyvät QR-koodin käyttöön uutuustuotteessa: käyttöön vaikuttaviin tekijöihin ja henkilökohtaisten tietojen antamiseen QR-koodin välityksellä. Vastattuasi kaikkiin kysymyksiin, paina lomakkeen lopussa olevaa Tallenna-painiketta, niin vastauksesi lähtevät eteenpäin. Kun olet tallentanut vastauksesi, kyselyyn ei voi enää palata.

Kaikki vastaukset käsitellään luottamuksellisesti, eikä yksittäisten vastaajien henkilöllisyys tule missään vaiheessa tutkimusprosessia esille. Tutkimuksen vastauksia ei luovuteta eteenpäin.

Arvon kaikkien kyselyyn vastaajien kesken 2 kpl Finnkinon leffalippuja. Osallistu arvontaa syöttämällä yhteystietosi lomakkeen loppuun. Yhteystietojasi ei yhdistetä vastauksiisi eikä niitä hyödynnetä tutkimuksessa arvontaa lukuun ottamatta. Yhteystietoja ei anneta eteenpäin.

Vastaan mielelläni mahdollisiin tutkimustani koskeviin kysymyksiin.

Ajastasi etukäteen kiittäen,
Anniina Markkula

Helsingin yliopisto
anniina.markkula@helsinki.fi

TAUSTATIEDOT

* Sukupuoli — Nainen ○ Mies ○

Ikä ? ☐

* Koulutusaste
○ Peruskoulu
○ Ammattikoulu / lukio
○ Alempi korkeakoulututkinto
○ Ylempi korkeakoulututkinto

Asuinpaikkakunta ☐

* Onko sinulla Facebook-tili?
○ Kyllä
○ Ei

QR-KOODIEN TUNTEMUS JA AIEMPI KÄYTTÖ

Esimerkki QR-koodista

* Tiedän mitä QR-koodit ovat?
○ Kyllä: tiedän mitä QR-koodit ovat ja olen skannannut niitä yli kaksi kertaa
○ Kyllä: tiedän mitä QR-koodit ovat ja olen skannannut niitä yksi tai kaksi kertaa
○ Osittain: tiedän mitä ne ovat, mutta en ole käyttänyt niitä
○ En oikein: olen nähnyt niitä, mutta minulla ei ole mitään käsitystä siitä mitä ne ovat
○ En: en ole huomannut niitä aiemmin

Mistä seuraavista asioista olet skannannut QR-koodin ?

- ☐ Ulkomainoksesta tai julisteesta
- ☐ Nettisivulta
- ☐ Sanomalehdestä tai lehtimainoksesta
- ☐ Mainoslehtisestä tai esitteestä
- ☐ Tuotepakkauksesta
- ☐ Tulostetusta etusetelistä
- ☐ Vaatteesta
- ☐ Muu
- ☐ En ole käyttänyt QR-koodia aiemmin

QR-Koodien käytön helppous ?

	Täysin eri mieltä	Osittain eri mieltä	En samaa enkä eri mieltä	Osittain samaa mieltä	Täysin samaa mieltä	En osaa sanoa
* QR-Koodien käyttö on helppoa	○	○	○	○	○	○
* Vuorovaikutus QR-koodisysteemin kautta on selkeää ja ymmärrettävää	○	○	○	○	○	○
* Yleisesti QR-koodit ovat helppoja ja käteviä	○	○	○	○	○	○

QR-KOODIEN KÄYTTÖ UUTUUSTUOTTEESSA

Seuraavat kaksi kysymystä koskevat sitä mikä motivoisi sinua skannaamaan uutuustuotteen pakkauksessa olevan QR-koodin. Tämä kysely koskee elintarvikkeita ja uutuustuotteella viitataan elintarvikkeeseen, joka on lanseerattu puolen vuoden sisään.

Skannaisin uutuustuotteen pakkauksessa olevan QR-koodin todennäköisemmin, jos ?

	Täysin eri mieltä	Osittain eri mieltä	En samaa enkä eri mieltä	Osittain samaa mieltä	Täysin samaa mieltä
* joku näyttäisi minulle miten se tehdään	○	○	○	○	○
* uskoisin skannauksen olevan helppoa	○	○	○	○	○
* hyödyt koodin skannaamisesta olisivat selkeät	○	○	○	○	○

Skannaisin uutuustuotteen pakkauksessa olevan QR-koodin, jos koodin kautta voisin ?

	Täysin eri mieltä	Osittain eri mieltä	En samaa enkä eri mieltä	Osittain samaa mieltä	Täysin samaa mieltä
* Saada alennuskupongin	○	○	○	○	○
* Osallistua kilpailuun	○	○	○	○	○
* Saada lisätietoa tuotteesta	○	○	○	○	○
* Kommunikoida muiden tuotteen kuluttajien kanssa	○	○	○	○	○
* Kommunikoida tuotteen tehneen yrityksen kanssa	○	○	○	○	○
* Antaa palautetta tuotteesta	○	○	○	○	○

Seuraava kysymys koskee sitä mikä motivoisi sinua antamaan henkilökohtaisia tietoja itsestäsi (kuten sähköpostiosoitteen) uutuustuotteen pakkauksessa olevan QR-koodin kautta. Tämä kysely koskee elintarvikkeita ja uutuustuotteella viitataan elintarvikkeeseen, joka on lanseerattu puolen vuoden sisään.

Antaisin henkilökohtaisia tietoja itsestäni (kuten sähköpostisoitteeni) uutuustuotteen pakkauksessa olevan QR-koodin kautta: ?

	Täysin eri mieltä	Osittain eri mieltä	En samaa enkä eri mieltä	Osittain samaa mieltä	Täysin samaa mieltä
* Saadakseni alennuskupongin	○	○	○	○	○
* Saadakseni lisätietoa tuotteesta	○	○	○	○	○
* Voidakseni antaa palautetta tuotteesta	○	○	○	○	○
* Voidakseni kommunikoida muiden tuotteen kuluttajien kanssa	○	○	○	○	○
* Voidakseni kommunikoida tuotteen tehneen yrityksen kanssa	○	○	○	○	○
* Voidakseni osallistua kilpailuun	○	○	○	○	○

KIITOS VASTAUKSISTASI!

Kysely päättyi tähän, tietosi tallentuvat kun painat lopussa olevaa "tallenna" painiketta. Kiitos ajastasi!

Voit osallistua Finnkinon leffalippujen (2 kpl) arvontaan täyttämällä tietosi alle. Tietojasi ei yhdistetä vastauksiisi tai anneta eteenpäin.

Nimi

Osoite

Sähköpostiosoite